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ANNOTATED BIBLIOGRAPHY/ BIBLIOGRAPHIE ANNOTÉE 1999 and / et 2000

December / décembre 2004

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FOREWORD

The annotated bibliography is produced on a bi-annual basis. This is the thirteenth annotated bibliography based on research which has been fully or partly funded by the Northern Scientific Training Program (NSTP). It is a combination of 1999-2000 and 2000-2001 research years.

Its aim is to provide a perspective on the range of research projects supported by the NSTP, and is designed to promote the exchange of information and collaboration among academics, northern experts and northern communities. Moreover, it demonstrates the significance of northern scholarship resulting from the Program.

The preparation of this bibliography has resulted from the collective efforts of several people. Accordingly, I would like to thank Mr. Michael Fidaoui, Samantha Tenasco and Nathalie Robillard for their assistance and Ms. Rhonda Turner for her overall coordination of the project.

AVANT-PROPOS

La bibliographie annotée est produite tous les deux ans. Il s'agit de la treizième bibliographie annotée recueillant des travaux de recherche financée en totalité ou en partie par le Programme de formation Scientifique dans le Nord (PFSN). Elle porte sur les travaux réalisés en 1999-2000 et 2000-2001.

Nous la publions afin de montrer l'étendue des travaux subventionnés par le PFSN et de favoriser l'échange d'information et la collaboration entre les universitaires, les spécialistes des questions nordiques et les collectivités du Nord. Nous désirons mettre en évidence la somme des connaissances résultant du PFSN.

Cette bibliographie fut réalisée grâce aux efforts et à la collaboration de M. Michael Fidaoui, Samantha Tenasco et M^{me} Nathalie Robillard, ainsi qu'à M^{me} Rhonda Turner, qui en a assuré la coordination. J'aimerais profiter de l'occasion pour leurs offrir mes sincères remerciements.

Sheilagh Murphy
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INTRODUCTION

This annotated bibliography comprises the abstracts of theses, essays, reports, seminar and conference presentations, and other scientific papers based on projects supported by the NSTP. All the abstracts were submitted, published or presented in 1999 or 2000.

The information contained in this bibliography was compiled mainly from the NSTP research reports submitted by students for the 1999-2000 and 2000-2001 research years. All information was checked for accuracy through follow-ups with the participating universities.

The first two sections of the bibliography (1999 and 2000) are alphabetically organized by university and by author. The bibliographical references were completed using the following criteria: author, abstract[1], discipline and fieldwork location. The indices of the bibliography are divided into three: author, discipline and fieldwork location.

The NSTP Secretariat received submissions from 16 Canadian universities for the 1999-2000 research year, for a total of 59 bibliographical entries. During 2000-2001, abstracts were submitted by 16 universities, for a total of 69 bibliographical entries.

[1] This symbol "←/→" was used to condense those abstracts/descriptions which were of considerable length.

INTRODUCTION

Cette bibliographie analytique renferme les résumés de thèse, d'essais, de rapports, de présentations à des séminaires et à des conférences ainsi que d'articles scientifiques divers liés à des travaux entrepris dans le cadre du PFSN. Tous les résumés ont été soumis, publiés ou présentés en 1999 ou 2000.

L'information présentée est tirée surtout des rapports de recherche soumis par des étudiants en 1999-2000 et 2000-2001. Les données ont fait l'objet d'une recherche documentaire puis d'un suivi auprès des universités concernées pour en assurer l'exactitude.

Les deux premières sections de la bibliographie (1999 and 2000) sont présentées par ordre alphabétique selon l'université et l'auteur. Les références bibliographiques renferment les éléments suivants : auteur, résumé[1], discipline et lieu des travaux sur le terrain. Les index sont divisés en trois parties : auteur, discipline et lieu du travail sur le terrain.

En 1999-2000, le Secrétariat du PFSN a reçu des soumissions de 16 universités, qui ont donné lieu à 59 notices bibliographiques. En 2000-2001, il a reçu des résumés de 16, qui ont donné lieu à 69 notices bibliographiques.

[1] Nous avons parfois utilisé le symbole "←/→" pour abréger les textes qui étaient trop longs.

ANNOTATED BIBLIOGRAPHY BY UNIVERSITY 1999/
BIBLIOGRAPHIE ANNOTÉE PAR UNIVERSITÉ 1999

UNIVERSITY OF ALBERTA

99-001 **ANDERSON, E. M. (1999).** Survival and behavior of juvenile red squirrels, *Tamiasciurus hudsonicus*. M.Sc. Thesis, University of Alberta, Faculty of Graduate Studies and Research.

ABSTRACT/DESCRIPTION:
Predation is often a major determinant of juvenile survival. Probability of survival may be affected if individuals can assess their risk of predation and adjust their behavior accordingly. The objective of this study was to determine if behavioral and survival differences existed between juvenile red squirrel living along the edge as compared to those living in the interior of the forest (i.e., are there edge effects?). An assumption made by many studies is that individuals performing 'risky' behaviors suffer higher predation rates. Another objective was to test this assumption by determining if various general behaviors (e.g., foraging, traveling, vigilance) predicted survival. Telemetry, direct observation, and live trapping was used to study behavior. No survival differences were noted between edge- and interior-born juveniles or their mothers. Hence, limited behavioral and survival edge effects could be demonstrated in this population. But, outer edge effects studies should still consider the potential implications of behavioral differences between individuals living along a patch edge as compared to those living in the patch interior. Although there may have been behavioral trade-offs between the amount of time spent foraging and resting, neither the behavior of juveniles or their mothers was found to be a consistent predictor of juvenile survival from emergence to weaning or to the end of summer. This highlights the importance of testing assumptions of predation risk.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

99-002 **BOWYER, V.E. et. al. (1999).** Caribou on Thandlat: Archaeology and Paleoecology of well-preserved sites on ice patches in SW Yukon. Paper, 32nd Annual Conference of the Canadian Archaeological Association, Whitehorse, Yukon, April 28 - May 2, 1999.

ABSTRACT/DESCRIPTION:
In 1997, well-preserved prehistoric artifacts and faunal material were discovered melting out of a permafrost snow patch in the Kusawa Lake area of the southwestern Yukon. Radiocarbon dates on caribou fecal remains from stratified deposits within the snow patch indicate that these animals were present in the area at least 2500 years ago, although they are absent in the region today. A wooden dart/arrow shaft recovered from the edge of the snow patch dates to 4300 years ago, and is a rare example of mid-Holocene organic technology in North America. The exceptional preservation of archaeological remains and high quality paleoenvironmental data at the Thandlat site offers a unique opportunity to explore a number of questions regarding human use of montane sites, the ecology of prehistoric caribou, and implications of climate change on caribou.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Whitehorse/Coast Mountain Eco Region, Yukon.

99-003 **BRIGHT, M. (1999).** Teaching and learning experiences of Dogrib teachers in the Canadian Northwest Territories. M.Sc. Thesis, Faculty of Graduate Studies, University of Alberta.

ABSTRACT/DESCRIPTION:
This study is a narrative inquiry which records the learning and teaching experiences of eight Dogrib Aboriginal teachers in the Northwest Territories, in the midst of the rapid changes occurring within their communities. The Dogrib people belong to the Canadian Athapaskan or Dene group of First Nations peoples. Within their life span, the way of life in their communities has changed from a predominantly hunting and gathering lifestyle to a wage-based, global, technological lifestyle. The study describes the results of such rapid change on the cultural traditions and the social environment of the people in the communities and the impacts of the change on the public education system. It articulates the cultural differences between the Dogrib culture and the mainstream Euro-Canadian culture which have implications for the educational system in the Dogrib school division. It explores the needs, as expressed by the Dogrib teachers who were interviewed, for continuing in-service support and professional development in their roles as teachers.

DISCIPLINE: Education.

FIELDWORK LOCATION: Rae-Edzo, Snare Lake, N.W.T.

99-004 **FAFARD, M. (1999).** Dechyoo Njik (MIVm-4) and traditional land use patterns in the SW portion of the Old Crow Flats, YT. M.Sc. Thesis, Faculty of Arts, University of Alberta.

ABSTRACT/DESCRIPTION:
This thesis presents the results of the excavation and analysis of the Dechyoo Nijik site (MIVm-4), a late prehistoric/historic camp located in the southwestern portion of the Old Crow Flats area, in the northern Yukon Territory. The major objectives of this research were to document the range of activities in Old Crow Flats and to improve the current understanding of pre-contact/contact period land use patterns. Dechyoo Njik was used as a summer multi-functional location, for the gathering of various resources, including fish, migratory waterfowl and muskrats. The artifact collection revealed the presence of a well-integrated technological system, characterized by the manufacture of simple stone tools aimed at sustaining a complex bone and antler industry. The prehistoric component of the site is culturally affiliated with the Klo-kut Phase (from 700 B.P. up to the Historic Period), which was already identified at other sites in the northern Yukon.

DISCIPLINE: Anthropology.

FIELDWORK LOCATION: Old Crow, Yukon.

99-005 **HARPER, K. A. (1999).** Variability in forest structure and composition along edge-to-interior gradients. Ph.D. Thesis, Faculty of Graduate Studies and Research, University of Alberta.

ABSTRACT/DESCRIPTION:
Variability in forest structure and composition along edge-to-interior gradients from

lakeshore and clear-cut edges and in riparian buffers in the aspen-dominated mixed wood boreal forest. Of the boreal forest landscape, inherent edges are prominent features and edges created by timer harvesting are becoming common. Both types border unharvested bugger zones left around lakes after harvest. Forest structure and composition along edge-to-interior gradients from lakeshore and clear-cut edges, and within buffer strips of different widths were investigated. There were 3 objectives: quantify trends and determine distance of edge influence for different responses for lakeshore and clear-cut edges; 2) assess edge influence for different age cut blocks; model edge influence and predict the width of interior forest in buffers of different widths. Trees, coarse woody material, saplings, shrubs, and herbs were sampled at different distances from edges, within buffer zones of different ages and widths, and in interior forest. Overall distance of edge influence from clear-cut edges extended about 20 m into the forest, and this did not differ substantially among edges at different aged cut blocks. Edge influence in narrow buffers is predicted to be greater for combined edge influence from lakeshore and clear-cut edges, and less if the riparian forest is resistant to edge influence. The 200 m buffers are the only ones predicted to have substantial interior forest habitat over time.

DISCIPLINE: Renewable Resources.

FIELDWORK LOCATION: Mackenzie Mountains, N.W.T.

99-006 LAMOUREUX, S. (1999). "Spatial and interannual variations in sedimentation patterns recorded in non-glacial varded sediments". Journal of Paleolimnology, 21: 73-84.

ABSTRACT/DESCRIPTION:
Multiple cores taken throughout Nicolay Lake in the Canadian High Arctic contain laminated sediments that are interpreted as varved. Annual sediment accumulation during the last 197 years reveals three major patterns that have important implications for hydroclimatic reconstruction. Widespread sediment dispersal is evident during most years and contrasts with years when anomalous localized and bifurcating patterns of deposition occur. Localized deposition is limited to the center of the lake and is attributed to turbidity current that originate on the delta foreslope. In contrast, a bifurcating pattern is produced when the river supplying the delta switches from one to two delta distributaries, resulting in altered proximal accumulation. Principal component analysis reveals additional accumulation anomalies that are sedimentologically indistinct, but constitute important sources of localized variance. The recognition and removal of anomalous deposition patterns is critical for accurate reconstruction of sediment flux from the catchment, particularly in long records where geomorphic conditions may have changed. This study identifies potentially misleading depositional artifacts and a methodology to recognize similar depositional controls in other lakes.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Cornwallis Island, Nunavut.

99-007 LIEVERSE, A. (1999). Human taphonomy at Khuzhir-Nuge XIV, Siberia. M.Sc. Thesis, Department of Anthropology, University of Alberta.

ABSTRACT/DESCRIPTION:
The purpose of this research is the investigations of human taphonomy at the Glaskovo (Lake

Neolithic/Early Bronze Age) cemetery site of Khuzhir-Nuge XIV, Siberia, in order to explain the unusual and highly variable condition of the human skeletal remains. The associations between three aspects of skeletal condition (completeness, fragmentation, and articulation), and eight (intrinsic and extrinsic) taphonomic factors are determined in order to identify those factors responsible for the variation in skeletal condition. Results indicate that extrinsic cultural factors (particularly mortuary practices), many of which have yet to be identified, account for most of the variable skeletal condition. Furthermore, the current understanding of Glaskovo mortuary protocol, as summarized in the literature, is not comprehensive enough to account for the extent of variability in skeletal condition evident at Khuzhir-Nuge XIV.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Khuzhir-Nuge XIV, Lake Baikal, Siberia.

99-008 **LIEVERSE, A. et. al. (1999).** Mortuary architecture and taphonomic processes: case study from Khuzhir-Nuge XIV, Siberia. Conference Abstract, International Symposium: Prehistory, Mortuary Practices, Death-Paleolithic, Mesolithic, Neolithic, Leuven, Belgium, September 1999.

ABSTRACT/DESCRIPTION:
Khuzhir-Nuge XIV is a late Neolithic/early Bronze Age cemetery site located on the west coast of Lake Baikal, Siberia. Research at Khuzhir-Nuge XIV, undertaken by a joint Canadian-Russian research team, is part of a long-term investigation into the processes of culture change among Neolithic and early Bronze Age hunter-gatherers in the Lake Baikal region. Excavations have already produced rich data sets, which will allow us to gain better insights into the biological, social, demographic, economic, dietary, and ritual aspects of culture change during this period. An explicit objective of our research at Khuzhir-Nuge XIV is to develop a comprehensive understanding of the full range of site formation processes active at this cemetery and ultimately responsible for the archaeological record available to us. Based on the results of the 1997 and 1998 fieldwork seasons, cultural and natural aspects of the Khuzhir-Nuge XIV site history appear to be quite complex and interesting. They involve a wide array of behavioral and natural factors, all of which warrant a detailed examination. In the current paper, we deal with the effects of both natural and cultural factors on overall burial condition. Particular attention is given to mortuary architecture and the state of human skeletal remains.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Lake Baikal, Siberia.

UNIVERSITY OF BRITISH COLUMBIA

99-009 **GILLIS, E.A. and KREBS, C.J. (1999).** "Natal dispersal of snowshoe during a cyclic population increase." Journal of Mammalogy, 80(3):933-939.

ABSTRACT/DESCRIPTION:
We used radiotelemetry to monitor movements of 35 juvenile snowshoe hares (*Lepus americanus*) from weaning until their first breeding season (June 1995-April 1996). Juveniles born on control or food addition areas were assigned to one of three cohorts of litters. We calculated natal dispersal distance (distance from nest site to breeding loctation) and frequencies of emigration (proportion dispersing more than twice the home-range diameter of adults) and determined the ages and dates at emigration. Natal dispersal distances ranged from 23 in to > 16 km. Fifty percent (9/18) of juveniles that survived to their first breeding season emigrated. Juveniles from the third litter dispersed at an older age than those from first and second litters. We detected no statistical effect of food addition on dispersal distance. With our small sample size, we did not find statistical evidence of sex-biased dispersal (7 of 12 males and 2 of 6 females dispersed).

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

99-010 **GRAHAM, A. and TURKINGTON, R. (1999).** "Population dynamics response of *Lupinus arcticus* to fertilization, clipping, and neighbour removal in the understory of the boreal forest". Canadian Journal of Botany, 78:753-758

ABSTRACT/DESCRIPTION:
A demographic study was conducted on field populations of *Lupinus arcticus* growing in the understory of a white spruce dominated forest, near Kluane Lake, Yukon. The relative effects of soil fertility level, neighbours, and herbivory were assessed using a factorial experiment of ± fertilizer (N-P-K), ± neighbour removal, and ± clipping. We monitored the dynamics of leaves and collected data on reproduction, survival, and size for two growing seasons. Fertilizing increased the incidence of disease on leaves and reduced reproductive efficiency. Clipping reduced leaf cohort survivorship, total leaf density, and the incidence of disease on leaves. Removing neighbours increased the percent cover of *L. arcticus* and decreased total leaf mortality. Treatments had no effect on the survival of leaves in early cohorts. Although there were some significant responses to treatments, the overall tendency was a lack of response, especially pertaining to leaf population dynamics. This low response to the treatments imposed is consistent with the argument that plants growing in low productivity, infrequently disturbed habitats should show little response to short-term changes in local environmental conditions. The results are also consistent with suggestions that plants in moderately stressed habitats should be more adapted to withstand grazing than competition.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Kluane Lake, Yukon.

99-011 **HICKS, S. and TURKINGTON, R (1999).** "Compensatory growth of three herbaceous perennial species: the effects of clipping and nutrient availability." Canadian Journal

of Botany, 78:759-767.

ABSTRACT/DESCRIPTION:
The continuum of responses model (CRM) and the growth rate model (GRM) make conflicting predictions about the effects of soil nutrient availability on the resilience of plants to herbivory. A factorial experiment was conducted in the understory of the boreal forest to examine the effects of fertilization and simulated herbivory on the rate and amount of regrowth of three herbaceous perennial species (*Achillea millefolium L., Festuca altaica Trin., and Mertensia paniculata* (Aiton). As clipping intensity increases various measures of plant performance decrease. Fertilization reduces the ability of clipped plants to compensate for biomass loss regardless of species and growth measure. Under natural soil fertility levels in this study, *M. paniculata* is more likely to compensate for leaf loss than *A. millefolium* and *E. altaica*. Contrary to the findings of previous field studies, the compensatory responses of the three species studied were most consistent with the predictions of the GRM. Plants in our study sites grow in nutrient poor soils, whereas the majority of compensatory studies have been carried out on herbaceous or woody plants in temperate regions. Resources are generally more abundant in temperate zones than in boreal forest zones, and the GRM may be a better predictor of compensatory ability of plants growing in naturally nutrient-deficient soils.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Kluane Lake, Yukon.

99-012 SECCOMBE-HETT, P.E. (1999). Summer Diet Selection by Snowshoe Hares. B.Sc. Thesis, Faculty of Graduate Studies, Department of Botany, University of British Columbia.

ABSTRACT/DESCRIPTION:
The primary objective of this study was to identify the plant species included in the diets of male snowshoe hares (*Lepus americanus*) during the summer months. Snowshoe hare selection for and against each plant species was assessed by comparing the relative use and availability of each plant species. The secondary objective was to examine several hypotheses of what influenced the selection of those species individually and within an integrated modelling framework. Three hypotheses were examined. i) Hares might select plants with high nutritional content (of energy or protein). ii) Hares might select plants to avoid or minimize deleterious plant secondary compounds (i.e. tannins and alkaloids). iii) Hares might select plants that minimize their risk of predation. The hare diet during the summer consists of five main plant species: *Betuld glandulosa, Festuca altaica, Lupinus arcticus, Salix spp.* and *Shepherdia canadensis*, although a number of other species were occasionally included. Nutritionally, hares select for plant species with high protein content and avoid toxic effects from secondary compounds by ingesting a diverse diet. Hares are not consistently found associated with any particular vegetation types, although they prefer habitats with both a dense understory and an abundance of preferred food species. Although some support was generated for all of the hypotheses of diet selection, no single hypothesis explained all of the observed patterns of diet selection. A linear programming foraging model combined with optimization techniques was thus used to examine the interactions between the variables. Overall, the model is successful in integrating the conflicting hypotheses of hare foraging. It appears that hares change their diet selection in response to conflicting goals such as reproductive condition and risk of predation. The model suggests that the interaction between plant protein and chemical defense compounds are the primary determinants of hare diet.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Alexandria Fiord, Nunavut.

UNIVERSITY OF CALGARY

99-013 **CLEMENT, D., FROESE, D.G. and SMITH, D.G. (1999).** Over 150,000 years of climate changes and cataclysms: the middle Yukon River stays in-grade. Research report, Canadian Quaternary Association - Canadian Geomorphology Research Group, Calgary, Alberta, August 23-27, 1999.

ABSTRACT/DESCRIPTION:
Collaborative geomorphic and stratigraphic evidence indicates, that despite glacial and interglacial cycles, the middle reach of the Yukon River in Alaska has been vertically stable (in-grade) throughout the Late Pleistocene and Holocene. This phenomenon has been observed in th 33,000km^2 physiographic region known as the Yukon Flats, where the gravel-bed Yukon River, 'braids' then 'wanders' 400km through a vast alluvial plain. A borehole at Fort Yukon indicates that until the Late-Pliocene, this tectonic subsidence basin held a large lake until it was finally infilled by tributary gravel fans. Remarkably, the borehole reveals only 25m of gravel overlying more than 300m of lake sediments. Even more remarkable is that *pinus* (Pine) was recovered in the lower part of the gravel, gone from Alaska since the Late Pliocene. Fieldwork reveals the maximum modem scour-hole dept in this system to be 25m. matching the depth gravel fill. At the SE margin of the Flats, high gravel terraces exist in the vicinity of Birch Creek near the town of Circle. These terraces show Pliocene pollen and floral assemblages, as well as non local lithologies, and thus, likely represent the high remnants of the ancestral Yukon and Birch Creek fans. Incision of these terraces and of the escarpment bordering the southern marginal upland of the Flats is constrained by the appearance of the Old Crow Tephra (150 Ka B.P.) in less overlying alluvial deposits near the elevation of the modern Birch Creek and Yukon R. valleys Regional base level is controlled by the Yukon River, to which the Birch Creek valley is graded. Thus, the creation of the surface of the low-gradient Yukon Flats is older than the Old Crow Tephra. Other evidence supports the possibility that the Yukon River has not changed its grade in this region. An infinite date of greater than 40,000 B.P., taken from 10 less overlying gravel in the canyon 25 km downstream of the Flats, constrains the age of downstream base-level control of the Yukon's alluvial plain. Another date of 11,500 +/- 70 B.P. is found at the contact between gravel and stabilized eolian sand and loess. This contact matches exactly the elevation of the modern gravel flood plain of the Yukon River and constrains the age of the physiographic difference between the Holocene 'scrolled' flood plain and the loess mantled alluvial-plain. Finally, multiple ground penetrating radar (GPR) profiles confirm only 14-30m of gravel overlay lake sediments throughout the Yukon Flats basin. The above evidence is further supported by a lack of any clear terraces, refuting Holocene incision, and no substantial elevation difference between modem and Late-Pleistocene deposits.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Yukon River, Yukon.

99-014 **FROESE, D.G. and SCHWEGER, C.E. (1999).** Upper Yukon Basin Loess: Reconstructing the Timing and Nature of Glacial-interglacial Transitions in the Western Yukon. Research report, Canadian Quaternary Association - Canadian Geomorphology Research Group, Calgary, Alberta, August 23-27, 1999.

ABSTRACT/DESCRIPTION:
In the last 4 years, investigations of terrace remnants in the unglaciated Upper Yukon basin have documented extensive loess deposits of early through late Pleistocene age. The deposits show an age range similar to the better known Gold Hill loess in the Fairbanks area, but have a number of local variations that make their interpretation complex. Sedimentologic, palcomagnetic and palynologic investigation has lead to a model of the origin of the glacial-interglacial cycles preserved in these deposits. The most striking characteristic of the

Midnight Dome Loess (MDL) is the occurrence of laterally continuous (>100 m) retransported organic-rich silt which contain interglacial pollen assemblages, in close association with colluvial (hillslope) diamict units (overlying). However, at present the hill slopes above the MDL are stabilized by a mature spruce forest, making the deposition of these organic-rich deposits is difficult to envisage under present (interglacial) conditions. A taphonomic model to the early-middle Pleistocene MDL organic silts is presented from 14C controlled analogues from the late Pleistocene Klondike mucks. Investigations of the mucks by Fraser and Burn (1997), Kotler (1998) and the authors, has documented- organic rich silts with similar sedimentologic characteristics: thin (0.1-1.5 m), sharp lower contacts, laterally-continuous (10s-loos metres) and occur in close association (below) hillslope diamict units. The most reliable 14C ages indicate deposition from 30-23 ka (and more questionable ages at one site between 47-39 ka which are probably infinite), suggesting the organics represent deposition at the start of the late Wisconsin rather than during the full interglacial. The most likely process to account for these deposits is hypothesized to be a geomorphic response to climate change in which accelerated hillslope deposition is favoured by the disappearance of the boreal forest during late Wisconsin (stage 2) cooling. Ibis process, and the similar depositional setting, suggests analogous conditions for the older MDL organic-rich silts is probable.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Yukon River, Yukon.

99-015 **FROESE, D.G. and SMITH, D.G. (1999).** "Ground penetrating radar investigation of the upper Yukon River valley between White River, Yukon and Eagle, Alaska." Yukon Exploration and Geology 1999, 211-216.

ABSTRACT/DESCRIPTION:
Ground penetrating radar (CPR) profiles were collected along mid-channel and side-channel bars from the confluence of the Yukon and White rivers in the Yukon, to Eagle, Alaska, a distance of 270 km. These profiles, although preliminary, demonstrate little variation in the thickness of valley-fill gravel (depth to bedrock) over that distance. Surveys show little difference in gravel thickness between the largest sediment source (White River) and more distal downstream r -caches, The average thickness is approximately 10 m, which is equivalent to the maximum scour depth of the river. GPR surveys across the Tintina Fault along the Yukon River indicate a similar depth of fill compared to the upstream and downstream reaches from the fault zone, suggesting no significant recent vertical movement. These observations, when combined with the uplift history of the region (rates of 50-70 mm/ka determined in the Klondike area), suggest the region is likely undergoing either very slow uplift or is stable. No differential uplift is detectable within the error limits and sampling density of the CPR valley-fill method used in this study.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Klondike Goldfields, Yukon River, Dawson Area, Yukon.

99-016 **LYTTLE, A. and MOORMAN, B.J. (1999).** Investigations in Glacial Hydrology Through the Use of Ground-Penetrating Radar. Poster presentation, Canadian Quaternary Association - Canadian Geomorphology Research Group, Calgary, Alberta, August 23-27, 1999.

ABSTRACT/DESCRIPTION:
Traditionally, glacial hydrology research has been limited by the use of dye tracer experiments, hydrograph separation, and hydrochemistry. The focus of the majority of glaciological research has been on either large ice sheets or temperate glaciers. Until

recently, the use of radar (including radio-echo sounding) in glaciology primarily focussed on ice thickness determination. New ground-penetrating radar (GPR) systems have recently been shown to be very effective in imaging detailed hydrological features such as conduits and cavities of glaciers. The focus of our research is to investigate the existence and structure of englacial and subglacial conduits and cavities within a glacier in the Canadian Arctic through the use of GPR. Previous research suggests the glacier is polythermal, and is retreating at a moderate rate. The glacier to be studied is Stagnation Glacier, located on the south side of Bylot Island, Nunavut Territory. Preliminary results will be presented from an extensive GPR survey conducted on the lower part of the glacier. The survey will be augmented with dye tracer experiments and thermal data collected from temperature cables installed in holes drilled into the glacier. The data collected will be used to model the structure of englacial and subglacial networks within the glacier.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Bylot Island, Nunavut.

99-017 **MOORMAN, B.J., DEACOCK, C. and LYTTLE, A. (1999).** Integration for Geomorphic Analysis : A Glacier Case Study - Bylot Island 1999. Poster presentation, Canadian Quaternary Association - Canadian Geomorphology Research Group, Calgary, Alberta, August 23-27, 1999.

ABSTRACT/DESCRIPTION:
Two of the key elements of many geomorphic analyses are the spatial relationships of features and their internal structures. Two recent technological developments have greatly aided the measurement of these two elements-global positioning systems and ground-penetrating radar. Used in combination, these technologies offer a very powerful tool for three dimensional mapping of the surface and near-subsurface of the earth. In July 1999 and experiment was undertaken to develop a conceptual framework or the coordinated collection of GPR and GPS data in an initial experiment examining glacial and proglacial geomorphic features on Bylot Island, Nunavut.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Bylot Island, Nunavut.

99-018 **SMITH, D.G. et. al. (1999).** Electrical Resistivity Ground Imaging, the Next Shallow Geophysical Revolution in Sedimentology and Geomorphology. Research Report, Canadian Quaternary Association - Canadian Geomorphology Research Group, Calgary, Alberta, August 23-27, 1999.

ABSTRACT/DESCRIPTION:
We believe that electrical resistivity ground imaging to assess stratipraphy, lithofacies and geometry of sedimentary deposits will be the next shallow geophysical revolution in Gemorphology. Sedimentary Geology and Quarternary Research will follow in the next decade, begining in the year 2000.While ground penatrating radar (GPR) became the most next popular shallow geophysical device in the 1900s, we believe that resistivity has a much greater potential use because it can operate in highly conductive sediments (clay, silt and dirty sand), whereas GPR cannot. As well, resistivity can work effectively in highly resistive sediment such as sand, gravel and boulder gravel. Resistivity is an old technology that formerly used only two pairs of electrodes without computer assistance. New resistivity systems commonly have 56 or more of the recently developed "smart electrodes". Smart electrodes reduce the number of wires in transmitter cables from 32 to 8, reducing the signal-to-noise ratio. Moreover, fast processing Pentium computers and new data processing software make resistivity a very efficient, non-evasive, cost effective device to image

subsurface geometries and lithologies. Currently the restivity (56 electrodes each seperated by 12m of cable) purchase price, including computer and software is about $70 000 Cdn. In this paper, we provide several recent resistivity examples of fluvial sedimentary deposits from a variety of depositional settings. From the Columbia River valley, resistivity is able to image the geometry of sand channel-rills measuring 45m wide by 5.5m dep while previous attempts with GPR, was unable to penetrate the silty sand. A second example from a catastrophic flood deposit located near Cochrane, west of Calgary indicates 12m of boulder gravel above till, approximately the same stratigraphy as was logged in an adjacent of exposure. Again, GPR was unable to operate because of shale fragments and the adjacent location of wire fences. From the Yukon River braid plain in Alaska, resistivity indicates approximately the same thickness of gravel as did the GPR, 14 m at the Circle and 25m at the Ft. Yukon. Given these examples and others, we are convinced that resistivity will become more useful than GPR in solving sedimentologic problems.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Yukon River, Yukon.

CARLETON UNIVERSITY

99-020 **KOKELJ, S.V. and LEWKOWICZ, A.G. (1999).** "Salinization of permafrost terrain due to natural geomorphic disturbance, Fosheim Peninsula, Ellesmere". Arctic, 52(4): 372-385.

ABSTRACT/DESCRIPTION:
Efflorescence (surface salt accumulations) are common on the Fosheim Peninsula and elsewhere in the Canadian Arctic Archipelago, especially at elevations below the Holocene marine limit, and cover up to 9% of the terrain in the vicinity of lower Hot Weather Creek. They are most extensive on naturally disturbed slopes and in flood plain locations. More than 75% of efflorescence are related to geomorphic disturbances (active layer detachment sliding, retrogressive thaw slumping and gullying) which initiate the causal chain of (1) surface erosion, (2) local degradation of permafrost, (3) contact between supra permafrost groundwater and soluble ions previously held with frozen sediments, (4) increase in total dissolved solids concentrations in slope surface runoff, and, dependent on the degree of channelization of drainage and the slope profile, (5) transport of dissolved solids directly to the stream system or their redistribution and accumulation downslope. Concentration of Na+ in surface runoff reached almost 5 g/L during summer 1996 at a recent (1988) detachment slide scar in marine sediments. These are sufficiently high to negatively affect most terrestrial arctic plant species. Soluble Na+ levels within the active layer suggest that concentrations in slope runoff will remain elevated for several decades. Climate warming, if it causes an increase in annual thaw depths or in the frequency and extent of geomorphic disturbances, could also result in active layer salinisation within areas of salt-rich permafrost, such as in marine surficial deposits.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Hot Weather Creek, Fosheim Peninsula, Ellesmere Island, Nunavut.

99-021 **CARRIÈRE, S. (1999).** "Comparative Spring Habitat and Food Use by Two Arctic Nesting Geese". Wilson Bulletin, 111(2):166-180.

ABSTRACT/DESCRIPTION:
The timing of egg laying is generally constrained by female condition, which is partly determined by the food available to her before laying. Although it was generally believed that geese rely exclusively on internal nutrient reserves for egg production, spring feeding is intensive in many populations of geese, significantly adding nutrients necessary for egg production and incubation. We compared the spring feeding ecology of Greater White-fronted Geese (*Anser albifrons frontalis*) and Canada Geese (*Branta canadensis hutchinsii*) on a shared nesting ground on the Kent Peninsula, NWT, where pairs feed intensively from arrival until incubation. Live plant biomass did not significantly increase within specific habitats during preincubation, but the total available biomass was greater after snow melt because habitats with higher biomass became available. Live plant biomass available in pond margins (30-60 G/m2) was 4-15 times higher than in habitats that were available earlier, i.e., mud-flats and hummocks (4-8 g/m2). Before snow melt, both species shared the 1-20% of the study area that was snow free (max density 600 pairs/km2), opportunistically used the only two available habitats, mud-flats and hummocks, and primarily ate (50-70%) tillers of *Puccinella* spp. During snow melt, pairs dispersed, pair density decreased (max of 40 pairs/km2), and interspecific differences in habitat and food use appeared. White-fronted Geese used pond margins and ponds more often than Canada Geese. After snow melt, White-fronted Geese predominantly fed in ponds on *Carex* spp. and *Dupontia fisheri* rhizomes and basal stems; Canada Geese continued feeding opportunistically, pecking leaves in all habitats and grubbing rhizomes in pond margins and ponds. White-fronted Geese used the grubbing technique more often than Canada Geese in all habitats and periods.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Kent Peninsula, N.W.T.

99-022 **FALLU, M.-A. (1999).** Holocene environmental and climatic changes in Quebec-Labrador preliminary chironomid results from a lake near Kangiqsualuijuaq. Research report, Canadian Quaternary Association - Canadian Geomorphology Research Group, Calgary, Alberta, August 23-27, 1999.

ABSTRACT/DESCRIPTION:
Holocene environmental reconstructions in northern Quebec-Labrador have been so far mainly based on a few palynological records, thus little is known about aquatic ecosystem evolution in this region. To get more information about the development and variability of aquatic ecosystems since the last deglaciation, diatoms and chironomids will be analysed in three long sediment cores from lakes situated in a south-north transect in the Quebec-Labrador border area. Transfer functions based on diatoms and chironomids are now-widely-used in reconstructions of past environmental. In the study region, models exist to infer water temperature from chironomids and to reconstruct water alkalinity and colour from diatoms. These quantitative tools will be useful to reconstruct past limnologic fluctuations closely related to lake catchment processes, which will yield a better understanding of climate dynamics and aquatic ecosystem evolution in the region since the last deglaciation. Furthermore, they will allow comparisons of the different methods used to reconstruct paleoenvironments (i.e., diatoms vs chironomids from the aquatic environment; and aquatic organisms (diatoms and chironomids) vs terrestrial indicators (pollen). A preliminary Holocene temperature reconstruction, inferred from chironomid remains, will be presented

for the northernmost lake situated near Kangiqsualujjuaq.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Kangiqsualujjuaq, Northern Québec-Labrador.

99-023 **HÉQUETTE, A., TREMBLAY, P. and HILL, P.R. (1999).** "Nearshore erosion by combined ice scouring and near-bottom currents in eastern Hudson Bay, Canada". Marine Geology, 158:253-266

ABSTRACT/DESCRIPTION:
A study of nearshore sedimentary processes was carried out in Manitounuk Sound, a sheltered environment protected by rocky islands along eastern Hudson Bay. High-resolution seismic profiles suggest that up to 10 im of Holocene sediments were eroded in less than 15 m water depth although these shallow depths are affected by low-energy waves and currents. According to our measurements of near-bottom currents at 3.7 and 5.6 m water depths, the threshold velocity for sediment motion (20 cm s-1) is only seldom exceeded, and consequently the significant erosion of the nearshore deposits can hardly be explained by hydraulic processes alone. Geophysical data (seismic and echosounding profiles) suggest that the observed 1* cc erosion is mainly due to bottom scouring by dragging ice keels. These data show that the zone of maximum ice scouring, C cc C between 8 and 12 m water depths, corresponds to the zone of maximum erosion of Holocene sediments. Because ice scouring in this area occurs when the sea is largely ice-free, wind-induced near-bottom currents probably contribute to the dispersal of the sediments resuspended by ice.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Manitounuk Sound, Northern Quebec.

99-024 **LEPAGE, D., DESROCHERS, A. and GAUTHIER, G. (1999).**"Seasonal decline of growth and fledging success in Snow Geese in the *Anser caerulescens*: an effect of date or parental quality?" Journal of Avian Biology, 30: 72-78.

ABSTRACT/DESCRIPTION:
Late-nesting birds frequently have a lower reproductive success than early-nesting ones. This could be a consequence of seasonal variations in environmental conditions or because late-nesting parents are of lower quality than early-nesting ones. We tested the hypothesis that a difference between early and late parent in their ability to raise viable offspring could explain the seasonal decline in offspring growth and survival in the Greater Snow Goose *Anser caerulescens atlanticus*, a species with self-feeding precocial young. Over two years, we exchanged complete clutches between early and late parents, to change the hatching date experienced by parents. We exchanged eggs between 164 experimental nests, whose hatching dates differed by 0 to 9 days (x = 3days). We detected no seasonal effect on survival rate in the sample of experimental nests, but there was a seasonal decline of growth rate. When delaying or advancing hatching, the fostered goslings grew respectively slower or faster compared to the parents original hatching date, indicating that variations in environmental conditions are responsible for seasonal variation of growth. However, growth of experimental goslings did not differ from unmanipulated goslings hatched at the same date. We conclude that the seasonal variation in reproductive success is not caused by a difference in parental quality between early and late nesters, but mostly by environmental factors directly related to the date of the season.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Bylot Island, Nunavut.

99-025 **TREMBLAY, J. (1999).** Analyse dendroécologique du changement récent dans le régime d'enneigement insulaire au réservoir Robert-Bourassa, Québec Nordique. Mémoire de Maîtrise, Faculté des études supérieures, Département de géographie, Université Laval, septembre 1999.

RÉSUMÉ/DESCRIPTION:
La création du réservoir Robert-Bourassa en Jamésie à l'hiver 1979-1980 entraîna une modification du patron de répartition de la neige au sol. Les îles qui étaient autrefois des sommets de colline, jouent maintenant le rôle de collecteur de neige. Afin de déterminer les effets des nouvelles conditions d'enneigement, un site insulaire dominé par l'épinette noire a été étudié au moyen de la dendrochronologie. La création du réservoir enclencha la dégradation de la structure forestière dans la partie moins dense de l'île. Les formes de croissance dégradées des arbres et les anomalies témoignent d'un changement dans l'enneigement local. La recherche montre que le sur enneigement a affecté le port des arbres surtout lors des premières années ayant suivi la création du réservoir. Les dommages lors d'hivers ultérieurs ont été moindres, non pas en raison de plus faibles chutes de neige, mais plutôt parce que la forêt ne pouvait être davantage transformée. Actuellement, une période de stabilité est remarquée. Une prochaine augmentation significative du niveau de neige pourrait enclencher à nouveau une série de dommages.

DISCIPLINE: Géographie physique.

LIEU DU TRAVAIL SUR LE TERRAIN: Réservoir Robert-Bourassa, Québec nordique.

UNIVERSITY OF MANITOBA

99-026 **MELNYK, S., FAST, H. and HENLEY, T. (1999).** Integrated management for Manitoba's marine coastline. Poster presentation, Beaufort Sea Conference, Inuvik, September 1999.

ABSTRACT/DESCRIPTION:
The Natural Resources Institute at the University of Manitoba and Fisheries and Oceans Canada (DFO) are working together to develop the framework for an integrated management plan for the marine coast of Manitoba, with emphasis on the region surrounding Churchill, Manitoba. To date, Manitoba's marine coastal interests have not been identified or examined in the context of integrated management, despite the wide range of activities and the potential for conflict within this area. Currently no formal management framework exists to bring together the interests, uses and priorities of the coastal zone, which is necessary to ensure sustainable use and conservation of such resources. Research identifying interest groups in Manitoba's marine coastal zone and their needs is necessary in order to meet the objectives set out in Canada's Oceans Act, in terms of integrated management and consensus-based decision-making. Such information is required to underpin the development of an integrated coastal zone management plan that will be of significant value to local people, provincial and federal governments.

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Churchill, Northern Manitoba.

99-027 **MUNDY, C.J., WILSON, K. and BARBER, D.G. (1999).** A Framework to Link Physical and Biological Processes with the North Water Polynya Sea Ice Flux. Poster Presentation, Gordon Research Conference on Polar Marine Science, Ventura, California, March 1999.

ABSTRACT/DESCRIPTION:
Modern knowledge on the connections of sea ice with the ocean, atmosphere, biology and climate change are far from being completely understood. The North Water region represents an area where a complex combination of physical and biological mechanisms surrounding sea ice is at work. This research will quantify the sea ice flux within the North Water region using a Geographic Information System (GIS) framework. It will also use this framework to examine possible links between the mechanism(s) acting to form and maintain the polynya and local primary productivity with the sea ice flux.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: North Water Region, North Baffin Bay, Nunavut.

99-028 **NEWTON, S., HENLEY, T. and FAST, H. (1999).** Sustainable Development in Churchill, Manitoba. Poster presentation, Beaufort Sea Conference, Inuvik, September 1999.

ABSTRACT/DESCRIPTION:
The Natural Resources Institute and the Department of Fisheries and Oceans are working together on projects in Churchill, Manitoba. This poster is based on research focused on an assessment of Churchill, Manitoba's sustainability and development options. The objective of this work is to evaluate the past, present, and future development plans, and make

recommendations that would contribute to long-term sustainability in the Town of Churchill. The Town of Churchill has experienced a wide range of development over the last 70 years, beginning with the development of the rail line connecting Churchill to the rest of the country in 1929. However, most of the developments have been unpredictable and relatively short-lived, which in turn have had negative environmental, economic and social impacts on the community. The methods for this research include a comprehensive literature review of the past, present and future developments in Churchill, and interviews with relevant stakeholders in the community. The poster illustrates the main components of research, including development options, sustainable development and integrated management. As Churchill is the focal point for development activities along Manitoba's coastal zone, the Oceans Act and contributions from this study may help to ensure new developments adhere to social, economic and environmental considerations.

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Churchill, Northern Manitoba.

99-029 **VELLEND, M. and WATERWAY, M.J. (1999).** "Geographic patterns in the genetic diversity of a northern sedge, *Carex rariflora*". Canadian Journal of Botany, 77:269-278.

ABSTRACT/DESCRIPTION:
We compared the genetic diversity of a northern wetland sedge, *Carex rariflora*, both within and between populations, in different habitat types, and across geographic regions with different glacial histories. Twelve populations were sampled: 5 from each of two regions in northern Quebec, and 2 from northern Yukon. Habitat types were medium to rich fens, wet tidal flat, and alpine stream edge. Allele frequency data revealed a low degree of within population genetic diversity (Hs = 0.07) and a high degree of genetic differentiation among populations (GST = 0.47) compared with previously studied northern wetland Carex species. Higher genetic variability found in the Yukon than in Quebec could be explained by the presence of a glacial refugium in much of Alaska and the Yukon throughout the Pleistocene. Low genetic diversity in Quebec suggests the occurrence of genetic bottlenecks resulting from founder effects during postglacial colonization. There was a strong positive correlation between geographic distance and genetic distance among populations, and the three geographic regions were genetically distinct from one another. Detrended correspondence analysis of vegetation data revealed clear differences among the three habitat types, but we found no significant correlation between habitat differences and genetic distance.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Yukon.

McMASTER UNIVERSITY

99-030 **ABONYI, S. and ROACH, I. (1999).** Sugar Disease: Diabetes Stories. Television documentary produced in conjunction with Wawatay Native Communication Society, aired on APTN, October 19 and 26, 1999.

ABSTRACT/DESCRIPTION:
"Sugar Disease: Diabetes Stories" is a one-hour documentary profiling the lives of six Mushkegowuk area diabetics. Interviews were conducted in the winter of 1998, and the final edits were completed in the Fall of 1999. The documentary had aired on TVNC and APTN and requests for copies have been received from diabetes educators and medical doctors. The documentary will be used as part of the education and support program in Moose Factory and along the west coast of James Bay

DISCIPLINE: Anthropology.

FIELDWORK LOCATION: Moose Factory, Northern Ontario.

99-031 **PETRONE, R. M., ROUSE, W.R. and MARSH, P. (1999).** "Comparative Surface Energy Budgets in Western and Central Subarctic Regions of Canada". International Journal of Climatology, 1131-1148.

ABSTRACT/DESCRIPTION:
The surface energy balance was measured over two summer seasons (1996 and 1997) at three Canadian subarctic sites. These were a wetland site in the central subarctic and a wetland and dryland site in the western subarctic. These sites have similar temperature regimes but the central subarctic site receives twice as much rainfall as each of the western sites. The sites display substantial differences in their surface characteristics. A comparison between the three study sites allows definition of the impact of surface controls on the surface energy budget, for the two subarctic locations. By comparing the evaporation rates between these three sites the surface control mechanisms at the local scale (i.e. microtopography, vegetation cover and organic layer thickness) can be examined relative to the larger scale geographical factors. The two wetland sites demonstrated similar evaporation behaviour but the dryland evaporates substantially less. This similarity in wetland evaporation in spite of major differences in rainfall and standing water demonstrates the importance of the surface organic layer in transporting and storing water for evaporation. The magnitude of convective and conductive heat fluxes is strongly correlated with temperature in both regions. Warm temperatures enhance the latent and ground heat fluxes while suppressing the sensible heat flux at all sites. Cold temperatures have the opposite effect.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Inuvik, N.W.T. and Churchill, Northern Manitoba.

MEMORIAL UNIVERSITY

99-032 GARDNER, G. (1999). Debating Land and Resources in Central Labrador. Conference Proceedings, Labrador Collaborative Research Workshop Proceedings, April 7-10, 1999.

ABSTRACT/DESCRIPTION:
Many key intersecting debates are taking place in central Labrador over land and land based resource development. This research project is an exploration of the way that land and resource developments in Labrador, such as Voisey's Bay, the Lower Churchill, and the Labrador Highway effect the relations between groups and individuals. Past anthropological research finds that in debates over land-use issues, such as low-level flying flight training, have involved the underlying issue of Aboriginal land claims and the advancement of cultural symbols in support of these claims. Because some of the areas slated for development are part of the land claimed by Aboriginal groups, aboriginality has become an issue in these debates. Land claims are based on legal and moral rights as the first occupants of the land and these claims "depend on Aboriginal people to construct a convincing history of their occupancy and use of the land ... the management of an ethnic identify is therefore crucial to the process of claiming land. . " (Plaice 1999:103). Some of the questions that I am examining include: What are the completing arguments, symbols and information being advanced in resource and development issues? How do completing claims to land and resources affect and impact the political structures and the organizations of those who are making them?

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Voisey's Bay, Labrador.

99-033 HIPFNER, J.M. and GASTON, A.J. (1999). "Timing of Nest Departure in the Thick-billed Murre and Razorbill: Tests of Ydenberg's Model" Ecology, 80(2):587-596

ABSTRACT/DESCRIPTION:
Marine birds of the family Alcidae exhibit extreme variation in the mass and age at which offspring leave the nest. A previously proposed, theoretical model of intraspecific variation in optimal timing of nest departure in alcids predicts that: (1) variation in growth rate among chicks will result in negative correlations between departure mass and departure age, and (2) in the absence of seasonal declines in chick growth rates (such declines are consistent features of alcid biology), variation in timing of hatching among chicks will cause both mass and age at departure to decline with hatching date. We tested these predictions for Thick-billed Murres and Razorbills, two alcids that employ a unique development strategy. To control for the confounding effects of seasonal variation in growth rates, caused at least in part by variation in the characteristics of adults breeding at different times, we switched eggs at random among breeding pairs in each of two years for both study species. Contrary to prediction 1, there were no significant negative correlations between departure mass and departure age, and in fact, there was one significant positive relationship. Contrary to prediction 2, departure mass did not decline with hatching date; in agreement with prediction 2, departure age often declined with date. Our results suggest that, for Thick-billed Murres and Razorbills: (1) variation in growth rate probably does not influence timing of nest departure in the manner outlined in the model, and (2) it is unlikely that variation in hatching date affects the departure decision in the manner predicted by the model. Based on our experimental results, and previously reported observations of Thickbilled Murres, we develop alternative hypotheses, emphasizing the roles of parental quality and wing growth (rather than increase in mass), to explain the close correspondence between the model's predictions and

patterns in the timing of nest departure within the Alcidae that are reported frequently.

DISCIPLINE: Zoology.

FIELDWORK LOCATION: Gannet Islands, Labrador.

UNIVERSITY OF OTTAWA

99-034 HIPFNER, M.J. and GASTON, A.J. (1999). "The Relationship Between Egg Size and Post-hatching Development in the Thick-billed Murre". Ecology, 80(4):1289-1297.

ABSTRACT/DESCRIPTION:
Many non-experimental studies have reported positive relationships between egg size and post-hatching survival or growth in birds. However, these results might be confounded by underlying correlations between egg size and parental attributes. At Coats Island (Northwest Territories, Canada), in 1994 and 1995, we examined the effects of egg size and parental quality on post-hatching growth in mass and wing length in the Thick-billed Murre, a colonial, cliff-nesting, Arctic seabird in which the single chick leaves the nest at a young age and at a preliminary stage of development. The relationship between egg size and parental quality was randomized by switching eggs among pairs. The size of the egg originally laid by the experimental females was used as a putative measure of their quality. The size of the egg from which the fostered chicks hatched had little effect on the rate at which they gained mass. Conversely, the rate of wing growth increased with egg size, the main difference occurring at 6-10 d of age, the period at which the primary coverts (the longest feathers on the wings of nestling murres) burst from the sheaths. It appears that the main difference in growth rate was created by the effect of egg size on the age at which the sheaths burst. The difference in feather length created by this effect was maintained through the nestling period. The size of the experimental pairs' original egg was a weak predictor of the growth of the chicks they fostered. In one year, chicks that had their wings grow quickly departed the nest at younger ages than those that had their wings grow slowly. This pattern is observed frequently in non-experimental Thick-billed Murre studies and was found among unmanipulated chicks in one year of this study. The length of the wing feathers probably has an effect on the chick's ability to depart successfully from the colony. We conclude that Thick-billed Murre chicks that hatch from large eggs have a developmental advantage that has potentially important consequences for their survival.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Coats Island, Nunavut.

99-035 LAMIRANDE, I., LAURIOL, B., LALONDE, A.E. et CLARK, I.D. (1999). "La production de limon sur les terrasses de cryoplanation dans les monts Richardson, Canada". Canadian Journal of Earth Science, 36:1645-1654.

RÉSUMÉ/DÉSCRIPTION:
Une production de limon est mise en évidence par une étude sédimentologique des terrasses de cryoplanation dans les Monts Richardson. Des analyses géochimiques, granulométriques et pétrographiques ont été effectuées dans les grés jurassique du groupe Bug Creek. Les résultats montrent que dans la roche non altérée les grains de quartz sont étroitement retenus par un ciment siliceux. Dans la roche altérée et très altérée, la porosité inter-granulaire augmente et les grains deviennent de plus en plus fissurés. Il en résulte que lorsque les grain sont libérés de la roche-mère, ils donnent surtout des sédiments de la taille des limons et en moindre abondance des sables et des argiles. Ce matériel recouvre le replat des terrasses de cryoplanation et constitue une source potentielle de loess pendant les périodes glaciaires. L'analyses des eaux ruissellement montre que leur PCO_2 est 100 fois élevée que dans l'atmosphère et qu'elles sont sous-saturées en silice amorphe, indiquant aussi taux de minéralisation chimique très bas. Toutefois, la météorisation du grès est probablement

accélérée par l'action chimique de l'eau, car en s'attaquant au ciment formant les surcroissances diagénétique des grains de quartz, celle-ci en facilite leur libération.

DISCIPLINE: Géographie physique.

LIEU DU TRAVAIL SUR LE TERRAIN: Monts Richardson, T.N-O.

99-036 **WOO, K., KOBER, K. and GASTON, A.J. (1999).** Differences in timing of incubation shifts between male and female Thick-billed Murres are associated with variation in maximum diving depths. Poster Presentation, Pacific Seabird Group, 26th Annual Meeting, Blaine, Washington, February 24-28, 1999.

ABSTRACT/DESCRIPTION:
Data on incubation shifts and maximum diving depths of Thick-billed Murres (*Uria lomvia*) at Coats Island, N.W.T. were collected during the 1998 breeding season. The timing and duration of incubation shifts were observed and measured for a group of known individuals over a series of extended observational periods. Results show an average shift length of 12hrs, with females attending mainly at night and males attending mainly during the day. At the same time, data was collected on the maximum diving depths of several individuals at different times of the day. Preliminary results indicate a difference in average maximum diving depths between those individuals that forage during the day and those that forage overnight, with average daytime diving depths greater than those at night. We suggest that timing of incubation shifts may be associated with changes in Thick-billed Murre foraging behavior.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Coats Island, Nunavut.

QUEEN'S UNIVERSITY

99-037 **BLAIS, J.M., DUFF, K.E., LAING, T.E. and SMOL, J.P. (1999).** "Regional contamination in lakes from the Noril'sk region in Siberia, Russia". Water, Air, and Soil Pollution, 110:389-404.

ABSTRACT/DESCRIPTION:
Sediment and water chemistry data were collected from ten lakes within a 110 km radius of Noril'sk in Siberia, the largest smelting complex in the world. Metals showing the most pronounced increase in enrichment near the smelters were Cu, Ni, Co, Ba and Zn. Cu and Ni appear to be as or more enriched in lake sediments around Noril'sk compared with levels previously reported for other locations. Although S04 concentrations were highly elevated in the areas closest to the smelting complex, lake water pH remained elevated due to high concentrations of base cations in the water. Sediment mercury enrichment was high in sediments near the smelting complex, but not more so than in other parts of the Arctic, suggesting that Hg either is not a major smelting product at Noril'sk, or that Hg is transported greater distances than other metals due to its longer atmospheric residence time.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Noril'sk region, Siberia, Russia.

99-038 **DOUGLAS, M.S.V. and SMOL, J.P. (1999).** "Freshwater diatoms as indicators of environmental change in the High Arctic". Cambridge University Press, "The Diatoms: Applications for the Environmental and Earth Sciences" 227-244.

ABSTRACT/DESCRIPTION:
Much of the arctic landmass that is not under ice sheets is dotted with lakes and ponds. Organisms living in tundra lakes and ponds must often survive low temperatures, extended ice and snow covers, extremes in photoperiods including long periods of continual darkness followed by 24-hour periods of daylight, and often low nutrient availability. Despite these extreme conditions, diatoms often dominate algal benthic communities in high arctic environments. High arctic diatoms provide environmental and earth scientists with many potential applications for paleoclimatic research and for biomonitoring other types of environmental change. Some of these approaches can also be applied to Antarctic studies. For example, there is currently considerable interest in reconstructing past climatic trends in polar regions, yet many traditional proxy techniques are fraught with difficulties in these extreme environments. Because even slight climatic changes can dramatically affect the length of ice and snow cover on arctic lakes and ponds, as well as other climate-related variables, diatoms can potentially be used to track paleoclimatic histories in dated lake and pond sediment cores. Past river inflows into lakes, which are influenced by climate, may be tracked by the deposition of lotic diatoms. Some of these analyses can be undertaken using high resolution techniques in varved sediment cores.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: High Arctic.

99-039 **DUFF, K.E., LAING, T.E., SMOL, J.P. and LEAN, D.R. (1999).** "Limnological characteristics of lakes located across arctic treeline in northern Russia". Hydrobiologia, 391:205-222.

ABSTRACT/DESCRIPTION:
Limnological data (e.g., water chemistry, lake water temperature, vegetation zone and degree of human impact) were collected from lakes spanning the Russian arctic treeline in three regions: on the Taimyr Peninsula near the mouth of the Lena River, both in central arctic Siberia, and near the mouth of the Pechora River, Western arctic Russia. Pearson correlation and canonical variates analyses revealed similar environmental gradients in all three regions. Variables expressing ionic composition of the water (i.e., cations, anions, dissolved inorganic carbon and conductivity) were highly inter-correlated, as were nutrients, chlorophyll a, particulate organic matter and metal (i.e., Fe and Mn) concentrations. Lake water transparency was related to water color (i.e., Fe, Mn and dissolved organic carbon) and productivity. Regional differences among the lakes were strong and appeared to reflect differences in geology, hydrology and human impact. For example, Na and Cl concentrations were related to proximity to the ocean and in the Lena and Pechora River regions but not in the more inland Taimyr region. Extensive mining and smelting at Norilsk, on the Taimyr Peninsula, has apparently resulted in elevated major ion and metal concentrations in lakes closer to the city. Surface water temperatures, nutrients and related variables were particularly useful for distinguishing lakes in different vegetation biomes.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Northern Russia.

99-040 **LAING, T.E., RÜHLAND, K.M. and SMOL, J.P. (1999).** "Past environmental and climatic changes related to tree-line shifts, Lena River Delta, Siberia". The Holocene, (9)5:547-557.

ABSTRACT/DESCRIPTION:
Changes in diatom assemblages in a sediment core taken from a tundra lake near the Lena River Delta, northeastern Siberia, reflect climatic and environmental changes throughout the Holocene. Significant limnological changes occurred at the same time as trees advanced into the region c. 9100 cal. yr BP (8500 radiocarbon yr BP) and subsequently retreated c. 3800 cal. yr BP (3500 radiocarbon yr BP). Prior to this tree-line shift, diatom assemblages were dominated by small benthic Fragilaria species, and diatom-inferred alkalinity values were high, suggesting that climat conditions were cool and relatively dry, and that lake productivity was probably low. Coincident with tree-line advance into the region c. 9100 cal. yr BP, inferred alkalinity decreased and remained low throughout the forested period, reflecting soil development and increased organic runoff associated with the shift in catchment vegetation. The establishment of a larch forest in the catchment corresponded with an initial period of limnological change between 9100 and 7700 cal. yr BP, suggesting that soil and forest development took place over approximately 1400 years. Between c7700 cal. yr BP (c. 7000 radiocarbon yr BP) and 3800 cal. yr BP, a stable diatom assemblage dominated by Achnanthes species and low diatom-inferred alkalinity indicate the influence of organic runoff associated with a fully developed forest.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Lena River Delta, Siberia.

UNIVERSITY OF SASKATCHEWAN

99-041 **COOLICAN, C.T., ANSDELL, K.M., STAUFFER, M. and KERRICH, R. (1999).** "Geology of the Tonalite-Migmatite Complex, Lake, Saskatchewan". Energy and Mines, Miscellaneous Report, 99-4, November, 1999.

ABSTRACT/DESCRIPTION:
In the summer of 1999, a 1:20,000 scale mapping transect across Deception Lake was completed to investigate a part of the Tonalite-Migmatite Complex (TMC) in the Reindeer Zone of the Trans-Hudson Orogen. Most of the transect is in rocks of the TMC; the northwestern part is underlain by rocks of the Wathaman Batholith. The supra crustal rocks of the TMC are composed of highly migmatized pelites to psammopelites and subordinate mafic volcanogenic rocks. The supra crustal units occur throughout the transect, although they are most abundant in the south and central parts. They are intruded by several phases of tonalite, the most extensive unit in the central part of the TMC. The contact between the Wathaman Batholith and the tonalites is marked by a transition zone, composed mainly of rocks of granodioritic composition. The Wathaman Batholith is mainly porphyritic granodiorite and granite. The area has been affected by two ductile deformational events during which several phases of tonalite were injected forming massive sheets. The supra crustal units were extensively migmatized prior to the intrusion of the Wathaman Batholith, although amphibolite grade metamorphic conditions outlasted this intrusive event.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Deception Lake, Northern Saskatchewan.

99-042 **DAMIEN, J.O. and MESSIER, F. (1999).** Preliminary Discussions on the Epidemiology of Brucellosis in Wood Buffalo National Park, Canada. Poster presentation, 48th Annual Wildlife Disease Association Conference, Athens, Georgia, August 8-12, 1999.

ABSTRACT/DESCRIPTION:
We present data on the epidemiology of brucellosis (*Brucella abortus*) in bison in Wood Buffalo National Park, Canada. Two hundred and seventy-six bison were captured and tested for brucellosis in the winter of 1997 (n = 136) and 1998 (n = 140). Sera were tested with the complement fixation test and buffered plate antigen test. Twenty-three percent (62/266) were positive, 70% (186/276) were negative and 7% (18/266) were suspicious reactors. Age significantly affected seroprevalence (Multiple logistic regression, Wald statistic = 16.5, d.f. = 5, p = 0.005, n = 266). Other factors did not contribute significantly to the logistic regression model (sex, region, body condition; p > 0. 1). Using a weighted least-squares non-linear regression technique, we fit a sigmoidal curve to the age-stratified serological profile. Using this function we estimate a function for the age-specific force of infection, the instantaneous per capita rate at which susceptible individuals acquire infection. The resulting function is age dependent in a non-linear fashion where young bison experience the greatest risk of infection. Above the age of five years, the force of infection drops to negligible levels. We discuss possible reasons for this pattern of infection.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Wood Buffalo National Park, Northern Alberta.

99-043 **DE ROSEMOND, S.C., LIBER, K., WAITE, D. and HARBICHT, H. (1999).** The Effects of Processed Kimberlite Ore Effluent on *Ceriodaphnia dubia*. Poster Presentation, 26th Annual Aquatic Toxicology Workshop, Edmonton, Alberta, October 2-6, 1999.

ABSTRACT/DESCRIPTION:
Processed kimberlite ore effluent (PKOE) is produced during mechanical extraction of diamonds from kimberlite ore. The effluent contains fine tailings (<0.5 mm), coagulants and flocculants which aid in the settling of the fines, and waste water from the washing processes employed during manual crushing of the ore. Acute (48 h) and chronic (7 d) toxicity tests using PKOE were conducted using *Ceriodaphnia dubia* as the test organism. Neither the supernatant nor the filtrate of PKOE was acutely toxic to *C. dubia*. Chronic toxicity tests of undiluted supernatant and filtrate of PKOE revealed that growth, reproduction and survival were adversely affected. Chronic serial dilution toxicity tests with two different batches of effluent indicated that filtered PKOE affected survival at concentrations of approximately 50%, and reproduction at concentrations as low as 12.5% to 25%. Examination of field data at the site of effluent discharge into the Long Lake Containment Area, Cell B, indicate that native cladoceran populations have decreased since the addition of PKOE.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Ekati Diamond Mine, N.W.T.

99-044 **JURCA, M. (1999).** The Importance of Meltwater Storage During Spring Snowmelt in a Subarctic River Basin. Research Report, Simon Fraser University, Department of Geography, August 18, 1999.

ABSTRACT/DESCRIPTION:
In late spring in 1999, a storage study was conducted for the Havikpak Creek basin in the Northwest Territories. In the basin, both snow and meltwater storage were monitored for various terrain types. The results indicated that meltwater storage occurred throughout the majority of the basin's terrains. Only on sloping and elevated level terrains was there not any melt water storage occurring. The duration, and timing of meltwater storage also varied between terrains. Storage in channels occurred sooner than storage in lakes and lowland areas. Furthermore, maximum storage in channels took place hours after the main melt had begun. As for the lake and lowland transects, the peak storage occurred several days after the main melt period had begun. Finally, problems were encountered in collecting data involving channel, lake, and basal ice storage. As a result, most of the data involving these three variables was more qualitative than quantitative in nature. A significant refining of the protocol for collecting data on channel, lake, and basal ice storage is wan-anted in order to obtain better results.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Havikpak Creek, N.W.T.

99-045 **MCLOUGHLIN, I.D. et. al. (1999).** Movement patterns of barren-ground grizzly bears in the central Northwest Territories, Canada. Poster, 3rd European Congress of Mammalogy, June, Jyvaskyla, Finland, June 3, 1999.

ABSTRACT/DESCRIPTION:
Between May 1995 and September 1997, 64 barren-ground grizzly bears (*Ursus arctos*) were equipped with satellite radio-collars within a study area of 190,000 km2, centered 400 km northeast of Yellowknife, Northwest Territories. Annual ranges of radio-tracked animals (:38 relocations per year) were estimated using the 95% fixed kernel technique with least squares cross validating t9 determine bandwidths. The mean annual range for adult males was 6,685 km (SE = 1,351, n 19), which was significantly larger than for females (mean = 2,074 km2, SE 335, n = 35). There was no difference in the annual ranges among females of differing family status. Seasonal rates of movement (calculated from straight-line distances between successive relocations) were significantly higher for males than for females. Both sexes decreased movement rates from their highest rates in spring (males) and summer (females) to lowest rates in autumn, which likely results from increased food availability as the year progresses. Annual ranges are the largest ranges reported for grizzly bears in North America. Low primary productivity on the barrens may explain why the annual ranges of barren ground grizzly bears are larger than the ranges of other grizzly bear populations.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Slave Geological Province, N.W.T.

99-046 WRIGHT, D.M., ANSDELL, K.M., CORRIGAN, D. and MAXEINER, R.O. (1999).
"Geology and Metamorphic Petrology of variably altered volcanic rocks in the southern Reindeer Lake area, northern Saskatchewan". Energy and Mines, Miscellaneous Report, 99-4.2., November 1999.

ABSTRACT/DESCRIPTION:
Variably altered volcanic and associated rocks of the Central Metavolcanic Belt have been identified in the south Reindeer Lake area. In conjunction with mapping by the Saskatchewan Geological Survey and Geological Survey of Canada, a selection of the volcanic occurrences on Reindeer Lake have been chosen for further study, including the determination of peak metamorphic conditions and the geochemical signatures of these units. To the north in the area of Laxdal Island, a thin band of intercalated volcanics, sediments, and banded iron formation have been identified and sampled. In the Milton Island area to the south, a much larger and continuous band of variably altered volcanic and intercalated sedimentary rock has also been identified and sampled. The pattern and mineralogy of the units of altered rock suggest that they underwent pre-metamorphic alteration, resulting in sufficient geochemical change to cause anomalous mineral assemblages upon metamorphism. The most significant of these is the occurrence of coedierite-anthophyllite schists, which have been associated with massive sulphide deposits in high-grade metamorphic terranes. Further investigation of the petrology and geochemistry of these rocks will assist in determining their tectonid roots, as well as their metamorphic evolution.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Reindeer Lake, Northern Saskatchewan.

99-047 WRIGHT, D.M., ANSDELL, K.M., CORRIGAN, D. and MAXEINER, R.O. (1999).
"Geology and Metamorphic Petrology of variably altered volcanic rocks in the southern Reindeer Lake area, Northern Saskatchewan." Summary of Investigations, 1999:2 (Miscellaneous Report, 99-4.2)

ABSTRACT/DESCRIPTION:
The Reindeer Lake area has been the recent focus of detailed lithological and structural mapping by the Saskatchewan Geological Survey and the Geological Survey of Canada. Metamorphosed and altered volcanic rocks and associated sedimentary rocks forming the northeastern extension of the Central Metavolcanic Belt were identified in the Reindeer Lake area. These rocks were subsequently subdivided into two belts by Maxeiner (1997), called the Reed Lake and Lawrence Point volcanic belts, and continue to be refined. Corrigan et. al. recognized volcanic and sedimentary rocks, including iron formation, in the Laxdal-Doucet islands area, and interpreted these as a northern extension of the La Ronge Domain. The purpose of this ongoing study is to characterize the petrology and metamorphic paragenesis of all these supracrusta rocks, as well as to determine their possible protoliths and depositional environment.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Reindeer Lake, Northern Saskatchewan.

SIMON FRASER UNIVERSITY

99-048 BRAND, M.J. (1999). Archaeological Investigations on the Dawson and Klondike City Hillsides. Conference Abstract, Canadian Archaeological Association, 32nd Annual Conference, Whitehorse, Yukon, April 30, 1999.

ABSTRACT/DESCRIPTION:
Archaeological investigations on the Dawson and Klondike City Hillsides typical of late 19th century mining camps, the population of Dawson City during the boom years contained a relatively large group of transients. Natural constraints on the limits of the townsite, and the high demand for land as the stampeders arrived, resulted in the occupation of the steep hillsides along the eastern margin of Dawson and the southern edge of Klondike City. Previous archaeological research by Parks Canada archaeologists on the Dawson hillside, suggests that these areas were inhabited by transients, who came seeking a fortune to return home to a better life. This paper presents the results of the 1998 season of the Dawson City Hillside Archaeology Project, which recorded structure platforms and surface artifacts on the Klondike City hillside and portions of the Dawson City hillside. This research provides insights into the lives of the transient people who lived there and the means by which they interacted with the rest of the community.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Dawson City, Yukon.

99-049 BRAND, M.J. (1999). A House on the Hill: Transient Life in Dawson City During the Klondike Gold Rush. Conference Abstract, Society for Historical Archaeology, 32nd Conference on Historical and Underwater Archaeology, Salt Lake City, Utah, January 8, 1999.

ABSTRACT/DESCRIPTION:
Of the thousands of people who joined the Klondike Gold Rush to make their fortune, few actually made any money mining gold. Those who did arrive in Dawson City found all the creeks staked. Many left soon after arrival. Others lingered for various lengths of time, forming a large group of transients within the community. Their presence was a key element in the popular perception of Dawson City and in the town's actual development. Archaeological investigations on the steep hillside along the east margin of Dawson, along with historical research, provide insight into transient Life in the Klondike and the integration of these individuals into the developing community.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Dawson City, Yukon.

99-050 LISSIMORE, D. et. al. (1999). "Large and consistent body mass differences of migrant Calidris sandpipers at adjacent stopover sites: phenomenon and possible explanations". Water Study Group Bulletin, 88:55-58.

ABSTRACT/DESCRIPTION:
Current theory emphasizes the importance of time and energy strategies over a whole migration in explaining patterns of variation in mass levels of migratory birds at individual stopover sites. These models predict similar masses for migrant populations at a given stage

of their journey. Data from three species of calidrid sandpipers over several years show that body masses are consistently 9-12% higher among birds caught on a large, open mudflat versus those caught at a small island lagoon nearby. The differences occur within all age/gender classes, and the birds do not differ in structural size between sites. We present several possible explanations for this difference, emphasizing the possibility that migrants are making state-specific short-term settlement decisions with respect to site-specific differences in local food and predator regimes.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Nome, Alaska.

99-051 THORPE, N.L. (1999). The Tuktu and Nogak Project. Conference Abstract, 10th Arctic Ungulate Conference, Trømso, Norway, August 9-12, 1999.

ABSTRACT/DESCRIPTION:
The Tuktu and Nogak Project is a community driven effort to collect and share Inuit ecological knowledge of caribou and calving areas in the Bathurst Inlet area of the Kitikmeot region, Nunavut, Canada. Ecological knowledge held by Inuit elders, hunters and other community members is shared through stories that are the fabric of Inuit culture, tradition and subsistence. Within these stories are key observations that can guide community members as well as decision makers. For example, hunters and elders know where the richest hunting grounds are or how to tell when the weather is going to change. These survival tips are based on repeated observations and have been passed down from one generation to the next. The Tuktu and Nogak Project recognizes the value of stones and their richness of Inuit ecological knowledge, particularly concerning caribou, and seeks to make them available to current and future generations. An advisory committee called the Tuktu and Nogak Board decides how the project proceeds. They determine how the knowledge is to be collected, and how it will be used and stored.

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Umingmaktuuq, Qingauk, Iqaluktuutiaq, Nunavut.

99-052 THORPE, N.L. and EYEGETOK, S.P. (1999). Inuit ecological knowledge of climatic influences on caribou and calving areas in the Kitikmeot region of Nunavut, Canada. Presentation, the 10th Arctic Ungulate Conference, University of Tromsø, Norway, August 9-13, 1999.

ABSTRACT/DESCRIPTION:
Inuit possess knowledge of caribou that is gained from an acute awareness of local lands and resources. This knowledge passes orally between generations, embodies adaptive self-management practices and is maintained through a relationship of respectful reciprocity with the environment. It is shared, compared and verified among community members on a daily basis. In referring to this insight as Inuit ecological knowledge, we recognize that aspects of this information cannot be obtained from other sources. During 1997 and 1998, thirty elders and hunters from the Kitikmeot region of Nunavut, Canada, were interviewed for the purpose of documenting Inuit ecological knowledge of caribou and calving areas of the Bathurst herd (*Rangifer tarandus groenlandicus*). Semi-directed interviews were conducted through a community driven participatory action research endeavour known as the Tuktu (Caribou) and Nogak (Calf) Project. Results from interviews held within communities, out on the land and during an elder-youth camp indicate that recent changes in climate have affected the Bathurst

herd in numerous ways. Since the 1950s, Inuit elders and hunters have observed both primary and secondary effects of a changing climate. A key primary effect is that regional vegetation has become more abundant and diverse. This has led to secondary effects such as altered caribou abundance, body condition, migration routes and calving ground location. Many interviewees stated that the observed change in vegetation has contributed to a healthier caribou population, with fatter and more numerous individuals. However, while interviewees said that the caribou population has generally increased, they have also observed more caribou fatalities. This contradiction points to the complex interconnectedness between various environmental factors. For example, interviewees observed that climatic changes have led to more incidents of caribou drowning and over-heating because of early melting and sea ice break-up. Caribou have become malnourished and have even starved to death when melted snow has later refrozen making vegetation unavailable for grazing. Inuit elders and hunters observed that spring and fall migrations and the location of the calving grounds have shifted, which they attribute to changes in climate and the related impacts on vegetation. This study suggests that Inuit ecological knowledge can provide interesting spatial and temporal insights regarding how climate effects the Bathurst caribou he rd. In addition, results emphasize the importance of exploring the relationships between climate and caribou biology, vegetation, migration, calving areas and caribou abundance rather than focussing on these variables in isolation.

DISCIPLINE: Resource Management.

FIELDWORK LOCATION: Umingmaktuuq, Qingauk, Iqaluktuutiaq, Nunavut.

UNIVERSITY OF TORONTO

99-053 **DARLENE, S. S. L. (1999)** An Examination of the Limnology and Freshwater Diatom, Autoecology of Bathurst Island, N. W. T., Canadian High Arctic. M. Sc. Thesis, Department of Geology, University of Toronto, 1999.

ABSTRACT/DESCRIPTION:
Limnology and diatom autoecology was examined for lakes and ponds on Bathurst Island, NWT, Canada.. Major ions are C2+, Na+,, M g 2+ and Cl-. Ionic concentrations and conductivity varied amongst sites largely as a function of elevation and proximity to the sea. Total nitrogen ranged from 247gg/L-1065.2pLg/L. Total (unfiltered) phosphorus ranged from 3.2gg/L64.Optg/L. PON:POP and TN:TPU analysis found 63% of the sites to most likely be limited. Linear regression analysis of chlorophyll a vs. TN revealed a significant correlation for limited sites, indicating that nitrogen may be limiting algal growth. Principle Components Analysis identified dominant limnological gradients. 148 diatom taxa were identified from surface-sediment of 29 lakes and ponds. Dominant species were small, pennate and benthic. *Fragilaria* and *Pinnularia* species dominated colder, larger sites; warmer, more nutrient-rich sites supported larger diatom assemblages. Canonical Correspondence and Weighted-Averaging analyses identified the potential to build diatom-based transfer functions for paleoreconstructions on Bathurst Island.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Bathurst Island, N.W.T.

99-054 **GILLON, C. (1999).** Why Wh-words Move and When: A Case Study in Inuktitut, M.A. Thesis, Linguistics, Department of Linguistics, University of Toronto, August 1999.

ABSTRACT/DESCRIPTION:
The grammar of questions in Inuktitut is unusual in that it has a form of interrogative marking on the verb and all wh-words (who, what, etc.) must also front to the beginning on the sentence. This is not predicted to occur under a generative approach to linguistics. However, I show that this property follows from the composition of the wh-words themselves and from the elements in the sentence such as the mood morphology on the verb.

DISCIPLINE: Linguistics.

FIELDWORK LOCATION: Tuktoyaktuk, N.W.T.

99-055 **JOOS, R. and HANSELL, R.I.C. (1999)** Vegetative structure, avian predator avoidance and foraging behaviour, Conference Poster, American Ornithological Union Conference, August 1999.

ABSTRACT/DESCRIPTION:

Vegetative structure also has a significant effect on larger bird species through predator avoidance syndromes and foraging/foraging avoidance strategies. Transects in the Churchill River tundra biome document significant negative impacts of seasonal foraging

of Branta canadensis on emergent as opposed to woody vegetation. Parallel transects in more southerly, Toronto, ecotones note very different foraging/foraging avoidance behavior and similar, but not identical, use of vegetative/spatial structures in predator avoidance. Landscape scale experimental manipulations show that presence/absence of Canada geese may be ecologically manageable by a combination of modified exclosures and vegetative structure reconfigurations in appropriate habitats.

DISCIPLINE: Ornithology/ Botany.

FIELDWORK LOCATION: Churchill, Northern Manitoba.

99-056 LIM, D.S.S. (2000). Tracking Climate Change in the Canadian High Arctic Using Paleoenvironmental Techniques. Poster Presentation, 14th International Symposium on Environmental Biogeochemistry, Huntsville, Ontario, September 1999.

ABSTRACT/DESCRIPTION:

The Canadian High Arctic is a distinct region of our planet in the way that it supports like, responds to shifts in the climate, and affects the environments of the rest of the globe. High Arctic characteristics such as low incoming radiation, small land mass, and high albedo surfaces, exacerbate the effects of hemispheric temperature trends and contribute to the environmental vulnerability of this area of our globe. High arctic environmental changes are not, however, isolated to this region, since they are strongly tied to general circulation patterns due to its inherent role as an energy sink. Further investigation of high arctic climate and environmental change is still needed to better understand their widespread effects, which necessitates (a) the acquisition of baseline ecological data, and (b) long-term monitoring efforts. Physical, chemical and biological linmological and paleolinmological data from the lakes and ponds that dot the High Arctic tundra can provide a means of meeting both of these requirements. In these water bodies, diatoms typically form a significant portion of the algal community. Their fossilized remains are used as bioindicators in investigations of past lake and ponds conditions.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Bathurst Island, Nunavut.

99-057 MCINTIRE, E.J.B. (1999). The effects of collared pika grazing on alpine tundra vegetation in Southwestern Yukon, M.Sc Thesis, Department of Botany, University of Toronto, Fall 1999.

ABSTRACT/DESCRIPTION:

In alpine tundra, rates of plant production were as low in 15-17 day short-term in situ pika removal exclosures as in control, unexclosed plots. After nearly two seasons of herbivore exclusion, sites with a history of grazing had much higher production than sites with no history of grazing, demonstrating an important influence of past grazing pressures when examined as a two year process. I also found that the pattern of pika grazing influence changed between two disjunct field sites separated by 40 km. When the effect of grazing on leaf demography for three species was examined, grazing history, rather than current

season grazing , was found to affect growth traits. In a common garden experiment, grazing history affected plant response to simulated pika herbivory in a sedge but not a composite. In all three experiments, grazing history was found to have a profound and very important impact on plant growth.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Southwestern Yukon Territory.

WILFRID LAURIER UNIVERSITY

99-058 DANBY, R.K. (1999). Regional Ecology of the St. Elias Mountain Parks: A Synthesi With Management Implications. M.Sc. Thesis, Department of Geography and Environmental Studies, Wilfrid Laurier University.

ABSTRACT/DESCRIPTION:
The St. Elias region of North America occupies portions of British Columbia, Alaska, and the Yukon Territory and comprises a network of public lands and protected areas managed by a variety of agencies. This thesis characterizes and analyzes the broad-scale, or regional, ecology of these lands and provides an assessment of the implications this has for ecosystem-based management - particularly as it relates to intergovernmental cooperation. A multi-stage, map-based, multidisciplinary process is used to synthesize information on the region's physical, biological, and institutional environments. The fields of conservation biology and landscape ecology provide the theoretical foundations for analysis. The ecological synthesis and analysis illustrate numerous ecosystem components that arc shared throughout the entire St. Elias region as well as physical and biological features and processes that serve as linkages between the region's parks and protected areas. Yet the synthesis and analysis also indicate that there are equally as many differences between the parks and protected areas, and that these areas are just as closely linked with surrounding unprotected areas. In combination, these results indicate that the greater St. Elias region actually represents the point at which several different regional-scale ecosystems converge, rather than a single, coherent ecological unit. These results suggest that an ecological foundation for unproved cooperation between management agencies does exist, but not in the form of an integrated, region-wide initiative as originally anticipated. Instead, the regional ecology of the St. Elias mountain parks and surroundings seems to advocate a more process-oriented approach to management wherein the exact boundaries of management are of secondary importance to the development of a coordinated set of principles, goals and objectives to guide planning and management. Nevertheless, defining spatially-onented frameworks for integrated environmental cooperation is seen as a key component of facilitating ecosystem-based management and five such areas are identified and recommended. The use of adaptive management and cumulative effects assessment are seen as valuable tools for use In ensuring the maintenance of ecological integrity and wilderness character of these areas and the region as a whole.

DISCIPLINE: Geography and Environmental Studies.

FIELDWORK LOCATION: Kluane, Haines Junction, Whitehorse, Yukon.

UNIVERSITY OF YORK

99-059 **HODGSON, R. (1999).** Preferential groundwater flow through polar desert patterned ground, Canadian High Arctic, Conference Presentation, Annual CAGONT Conference, McMaster University, October 1999.

ABSTRACT/DESCRIPTION:
Physical processes causing patterned ground formation common in arctic soils often sort soil particles, creating heterogeneous soil profiles within small areas (I M2 _ 10 X 102 M2) . Heterogeneous soil profiles should show differences in soil hydraulic conductivity values at this small scale. Quantification of groundwater flow into arctic hydrologic systems such as wetlands does not commonly account for this small-scale variability in soil structure. Two types of patterned ground (frost mounds and stripes) on Cornwallis Island, NU were studied during the 1999 summer season as a preliminary investigation to asses the need for groundwater flow quantification at this scale. Both ground features showed evidence of particle sorting at the surface, after excavation the extent of sorting with depth was found to be greater at the frost mound site than stripe site. Estimates of groundwater flow rates through frost mound features (I -2m diameter) showed a significant difference (I OX) between mound center (clay rich) and mound rim (gravel rich) areas. Groundwater input passing though zones of frost mounds to small wetlands could be in error if this process is not accounted for spatially. Preliminary results suggest a need for further study of common pattered ground features and quantification of flow rates during different hydrologic conditions (i.e. snowmelt and rain events).

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Resolute Bay, Cornwallis Island, Nunavut.

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UNIVERSITY OF ALBERTA

00-001 **BLAKE, D. S. (2000):** Inuit Autobiography: Challenging the stereotypes. Ph.D. Thesis, University of Alberta.

ABSTRACT/DESCRIPTION:
This thesis examines the works of 8 Inuit autobiographers of contact zones and sites of metissage between 1894 and 1993. Case studies investigate how writers respond to stereotypical ideas of Inuit people; how they write against them in some cases, comply with them in others, or employ them for their own uses. It studies the effects of hybridity on the self-fashioning of the Inuit autobiographical self, and how that self adjusts to changing material and ideological circumstances in order to survive. Founded on the argument that the site of metissage is one of contact, and often conflict, of cultural expressions, it focuses on the ways in which Inuit autobiographers (and on occasion, white editors/collaborators), by exploring and adapting to these conflicting ideologies, bring new perspectives hitherto relegated to the margins of the Western autobiographical canon.

DISCIPLINE: English.

FIELDWORK LOCATION: Arctic/Subarctic.

00-002 **LAMOUREUX, S. (2000).** "Five centuries of interannual sediment yield and rainfall-induced erosion in the Canadian High Arctic recorded in lacustrine varves." Water Resources Research, 36 (i):309–318

ABSTRACT/DESCRIPTION:
A 487-year sediment yield record based on the varves from Nicolay Lake, Nunavut, Canada, is used to investigate long-term yield variability. A general extreme value model, estimated with probability-weighted moments, was used to identify the magnitude and timing of the low-probability events. Exceptional sediment yields in 1951 and 1962 coincided with the two largest rainfalls on record. Smaller multiday rainfalls were also recorded in the varves as subannual rhythmites, although rhythmites were not generated by rainfall events that occurred during the nival flood or after prolonged warm weather. By accounting for probabl e soil moisture conditions and the timing of nival floods compared to major rainfall, rhythmites in all but 3 years of the sediment record can be explained by storms exceeding - 13 mm total. Generally, more frequent extremes and increased variance in yield occurred during the 17th and 19th centuries, likely due to increased occurrences of cool, wet synoptic types during the coldest period of the Little Ice Age.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Nicolay Lake, Cornwall Island, Nunavut.

00-003 **LAMOUREUX, S. (2000).** "Late Wisconsinan glaciation of the Central Sector of the Canadian High Arctic." Quaternary Research,54(2):182-188.

ABSTRACT/DESCRIPTION:
Geomorphic and chronological evidence from Cornwall Island in the High Arctic

Archipelago provides direct evidence for the age and dynamics of the center and northern flank of the Innuitian Ice Sheet that covered the islands during the Late Wisconsonian glacial maximum. Dispersal of erratics and glacial landforms indicate that ice flowed north across the island and converged with ice flowing northwest from Norwegian Bay. Cornwall Island was initially deglaciated at 9000 14C yr B.P. in near synchrony with widely separated sites in adjacent parts of the archipelago. This regional chronology suggests rapid breakup of a marine-based Innuitian Ice Sheet that was destabilized by rapid eustatic sea-level rise and ice thinning during the early Holocence. This evidence provides strong support for a recently proposed ice divide spanning the central part of the Canadian High Arctic and indicates that most, if not all, of the region was glaciated during the late Wisconsonian.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Cornwall Island, Nunavut.

00-004 WOHLLEBEN, T.M.H. and SHARP, M.J. (2000). Interal temperature distributions of a high arctic polythermal glacier. Poster presentation, 6th National Student Conference on Northern Studies, Quebec City, Quebec, May 6-7, 2000.

ABSTRACT/DESCRIPTION:
Polythermal glaciers in the Canadian High Arctic have unique internal temperature distributions. While they are composed almost entirely of cold ice (ice below the pressure melting point), areas of basal ice in the lower ablation zones reach the pressure melting point. This has implications for the flow and subsequent evolution of the geometry of the glacier. We propose that John Evans Glacier, on the central coast of Ellesmere Island, Nunavut, Canada, is an example of such a high arctic, polythermal glacier. The steady state internal temperature distribution of this glacier is calculated using a 2D thermal ice model, which is integrated over a 125m grid in the horizontal and over 4 vertical layers. This model uses digital elevation models of the bed and the surface of the geometric boundary conditions, and is initialized with measured mean surface air and near-surface ice temperatures. The results are compared with radar data of the internal structure of the ice, and with the bed reflection coefficients from the radar (which describe the distribution of warm/cold based ice). The computed distributions of warm and cold ice are also evaluated against the measured internal temperature distributions of other high arctic polythermal glaciers. Sensitivity experiments test the response of the glacier's internal temperature to variations in geothermal heat flux, and to variations in surface temperature distributions.

DISCIPLINE: Glaciology.

FIELDWORK LOCATION: John Evans Glacier, Ellesemere Island, Nunavut.

UNIVERSITY OF BRITISH COLUMBIA

00-005 GILLIS, E.A., and KREBS, C.J. (2000). "Natal dispersal of snowshoe during a cyclic population increase". Journal of Mammalogy, 80(3):933-939

ABSTRACT/DESCRIPTION:
We used radiotelemetry to monitor movements of 35 juvenile snowshoe hares (*Lepus americanus*) from weaning until their first breeding season (June 1995-April 1996). Juveniles born on control or food addition areas were assigned to one of three cohorts of litters. We calculated natal dispersal distance (distance from nest site to breeding loctation) and frequencies of emigration (proportion dispersing more than twice the home-range diameter of adults) and determined the ages and dates at emigration. Natal dispersal distances ranged from 23 in to > 16 km. Fifty percent (9/18) of juveniles that survived to their first breeding season emigrated. Juveniles from the third litter dispersed at an older age than those from first and second litters. We detected no statistical effect of food addition on dispersal distance. With our small sample size, we did not find statistical evidence of sex-biased dispersal (7 of 12 males and 2 of 6 females dispersed).

DISCIPLINE: Environmental Science/Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

00-006 GRAHAM, A. and TURKINGTON, R. (2000). "Population dynamics response of *Lupinus arcticus* to fertilization, clipping, and neighbour removal in the understory of the boreal forest." Canadian Journal of Botany, 78(6), June 2000.

ABSTRACT/DESCRIPTION:
A demographic study was conducted on field populations of *Lupinus arcticus* S. Wats. growing in the understory of a white spruce dominated forest, near Kluane Lake, Yukon. The relative effects of soil fertility level, neighbours, and herbivory were assessed using a factorial experiment of ± fertilizer (N-P-K), ± neighbour removal, and ± clipping. We monitored the dynamics of leaves and collected data on reproduction, survival, and size for two growing seasons. Fertilizing increased the incidence of disease on leaves and reduced reproductive efficiency. Clipping reduced leaf cohort survivorship, total leaf density, and the incidence of disease on leaves. Removing neighbours increased the percent cover of *L. arcticus* and decreased total leaf mortality. Treatments had no effect on the survival of leaves in early cohorts. Although there were some significant responses to treatments, the overall tendency was a lack of response, especially pertaining to leaf population dynamics. This low response to the treatments imposed is consistent with the argument that plants growing in low productivity, infrequently disturbed habitats should show little response to short-term changes in local environmental conditions. The results are also consistent with suggestions that plants in moderately stressed habitats should be more adapted to withstand grazing than competition.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Kluane Lake, Yukon.

00-007 GILLIS, E. and KREBS, C.J. (2000). "Survival of dispersing versus philopatric juvenile snowshoe hares: do dispersers die?" Oikos, 90(2):343-346.

ABSTRACT/DESCRIPTION:
We used radio-telemetry to monitor the survival of dispersing and philopatric juvenile snowshoe hares (*Lepus americanus*) in southwestern Yukon Territory, Canada, during a cyclic population increase. Neither 28-d survival nor the proportion of hares surviving to breed differed significantly between juvenile hares that dispersed and those that did not, nor was there a significant relationship between dispersal distance and fate (dead or alive). Our results indicate that the overall survival cost associated with natal dispersal is low for snowshoe hares during the early increase of the hare cycle.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Kluane Lake, Yukon.

00-008 HICKS, S. and TURKINGTON, R. (2000). "Compensatory growth of three herbaceousperennial species: the effects of clipping and nutrient availability." Canadian Journal of Botany, 78:759-767.

ABSTRACT/DESCRIPTION:
The continuum of responses model (CRM) and the growth rate model (GRM) make conflicting predictions about the effects of soil nutrient availability on the resilience of plants to herbivory. A factorial experiment was conducted in the understory of the boreal forest to examine the effects of fertilization and simulated herbivory on the rate and amount of regrowth of three herbaceous perennial species (*Achillea millefolium L.*, *Festuca altaica Trin.*, and *Mertensia paniculata* (Aiton) G. Don.). As clipping intensity increases various measures of plant performance decrease. Fertilization reduces the ability of clipped plants to compensate for biomass loss regardless of species and growth measure. Under natural soil fertility levels in this study, *M. paniculata* is more likely to compensate for leaf loss than *A. millefolium* and *E altaica*. Contrary to the findings of previous field studies, the compensatory responses of the three species studied were most consistent with the predictions of the GRM. Plants in our study sites grow in nutrient poor soils, whereas the majority of compensatory studies have been carried out on herbaceous or woody plants in temperate regions. Resources are generally more abundant in temperate zones than in boreal forest zones, and the GRM may be a better predictor of compensatory ability of plants growing in naturally nutrient-deficient soils.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Kluane Lake, Yukon.

00-009 SINCLAIR, A.R.E., KREBS, C.J., FRYXELL, J.M. et.al. (2000). "Testing hypotheses of trophic level interactions: a boreal forest ecosystem." Oikos, 89(2):0030-1299.

ABSTRACT/DESCRIPTION:
Models of community organization involve variations of the top-down (predator control) or bottom-up (nutrient limitation) hypotheses. Verbal models, however, can be interpreted in different ways leading to confusion. Therefore, we predict from first principles the range of possible trophic level interactions. and define mathematically the instantaneous effects of experimental perturbations. Some of these interactions are logically and

biologically unfeasible. The remaining set of 27 feasible models is based on an initial assumption, for simplicity, of linear interactions between trophic levels. Many more complex and non-linear models are logically feasible but, for parsimony, simple ones are tested first. We use an experiment in the boreal forest of Canada to test predictions of instantaneous changes to trophic levels and distinguish between competing models. Seven different perturbations systematically removed each trophic level or, for some levels. supplemented them. The predictions resulting from the perturbations were concerned with the direction of change in biomass in the other levels. The direct effects of each perturbation produced strong top-down and bottom-up changes in biomass. At both the vegetation and herbivore levels top-down was stronger than bottom-up despite some compensatory growth stimulated by herbivory. The combination of experiments produced results consistent with two-way (reciprocal) interactions at each level. Indirect effects on one or two levels removed from the perturbation were either very weak or undetectable. Top-down effects were strong when direct but attenuated quickly. Bottom-up effects were less strong but persisted as indirect effects to higher levels. Although the 'pure reciprocal' model best fits our results for the boreal forest system different models may apply to different ecosystems around the world.

DISCIPLINE: Botany.

FIELDWORK LOCATION: Kluane Lake, Yukon.

00-010 TREBERG, A.M. (2000). Patterns of diversity in high arctic snowbed plant communities at Alexandra Fiord, Ellesmere Island, Canada. B.Sc. Thesis, Department of Geography, University of Guelph, March 2000.

ABSTRACT/DESCRIPTION:
This study examines the patterns' of diversity within three natural snowbeds and one manipulated snowbed at Alexandra Fiord, Ellesmere Island in the Canadian High Arctic. Recent predictions of climate change in the Arctic suggest that not only will temperature increase, but also snowmelt will be earlier leading to a longer growing season. Experimental manipulations of snowmelt were begun in 1992 in a late-lying snowbed in order to determine the response of species to longer and shorter growing seasons. ←/→ Patterns of alpha diversity within the natural snowbeds were not significantly related to snowmelt, although there were more graminoid species in the earliest melting plots, with the longest growing season, and more forbs species in the last plots to melt. The manipulated snowbed, with snow removal, snow addition and control plots, also had more graminoid species in the plots where snow had been removed. The lowest species richness was found in the snow addition plots while greatest richness was found in the removal plots. However, evenness increased in both the addition and removal plots. This suggests that the graminoid species will likely become more abundant in the short term if the growing season length increases as a result of climate change. The importance of this work is that it is the first evidence that snowmelt changes will alter the structure of arctic communities, although more research is necessary to determine the resultant finictional changes that will likely accompany structural changes in these and other arctic tundra ecosystems.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Alexandra Fiord, Ellesmere Island.

UNIVERSITY OF CALGARY

00-011 **DUANE, G., FROESE, D. and SMITH, D.G. (2000).** "Ground penetrating radar investigation of the upper Yukon River valley between White River, Yukon and Eagle, Alaska." Exploration and Geology 1999, p. 211-216.

ABSTRACT/DESCRIPTION:
Ground penetrating radar (GPR) profiles were collected along mid-channel and side-channel bars from the confluence of the Yukon and White rivers in the Yukon, to Eagle, Alaska, a distance of 270 km. These profiles, although preliminary, demonstrate little variation in the thickness of valley-fill gravel (depth to bedrock) over that distance. Surveys show little difference in gravel thickness between the largest sediment source (White River) and more distal downstream reaches. The average thickness is approximately 10 m, which is equivalent to the maximum scour depth of the river. GPR surveys across the Tintina Fault along the Yukon River indicate a similar depth of fill compared to the upstream and downstream reaches from the fault zone, suggesting no significant recent vertical movement. These observations, when combined with the uplift history of the region (rates of 50-70 mm/ka determined in the Klondike area), suggest the region is likely undergoing either very slow uplift or is stable. No differential uplift is detectable within the error limits and sampling density of the GPR valley-fill method used in this study.

DISCIPLINE: Geology.

FIELDWORK LOCATION: White River, Yukon.

00-012 **FROESE, D.G, PREECE, S. and WESTGATE, J. (2000).** "Onset of mid-pliocene permafrost and the pre-glacial to glacial transition in the klondike area, Yukon Territory." Abstract, 30th International Arctic Workshop, Program and Abstracts. p.66-68.

ABSTRACT/DESCRIPTION:
Recent stratigraphic, geochronologic, and palynelogic investigations of the Klondike goldfields, west-central Yukon, reveal a rich record of Plio-Pleistocene deposits interbedded with over 30 tephras recording much of the last 4 Ma. Surprisingly, these tephras are largely distinct from those found in the Fairbanks area, with only 3 known correlatives (NT, Sheep Creek and Old Crow). The Klondike deposits are of particular interest since they include sediments that immediately precede and follow the onset of glaciation in the region, and provide an important dataset relative to other Pliocene records in northwestern North America. Since work on tephras and the younger stratigraphic record (mid-late Pleistocene) is still in progress (palynology, regional correlation and fission track dating), aspects of this dataset will most certainly be refined in the near future. This presentation focuses on the mid-Pliocene record of permafrost, and the earliest evidence of glaciation in the Klondike area.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Klondike Area, Yukon.

00-013 **FROESE, D.G., BARENDREGT, R.W., ENKIN, R.J. and BAKER, J. (2000).** "Paleomagnetic evidence for multiple Late Pliocene - Early Pleistocene glaciations in the Klondike area, Yukon Territory." Canadian Journal of Earth Sciences, 37(6): 863-877

ABSTRACT/DESCRIPTION:
The Late Pliocene - Early Pleistocene terraces of the Klondike area provide a conformal record of sedimentation which marks the transition from preglacial to glacial conditions, and is one of the most complete records of glaciation and interglaciation in the northern Cordillera. Preglacial sedimentation is recorded in the Lower White Channel gravel that contains a reverse-normal polarity sequence. A re-aggradation of the nonglaciated valleys of the goldfields in response to Late Pliocene cooling is recorded by the Upper White Channel gravel, which is characterized by a dominant normal polarity with a lower reversal likely associated with the first ice-wedge casts. Klondike gravel interfingers with Upper White Channel and is normally magnetized, indicating an equivalent magnetostratigraphic unit. This glaciofluvial gravel provides evidence of extra-basinal clasts, marking a major reorganization of drainage associated with the first advance of the Cordilleran Ice Sheet in western Yukon Territory correlated with the Gauss chron (>2.58 Ma). An intermediate terrace in Klondike valley is overlain by 8 m of fluvial and glaciofluvial gravel named the Midnight Dome gravel. This gravel is mantled by 15 m of loess and hillslope deposits, named the Midnight Dome loess, which preserve at least three interglacial pollen assemblages, and a reverse-normal-reverse-normal polarity sequence assigned to the late Matuyama chron, including Jaramillo subchron (1.07-0.99 Ma), and early Brunhes chron (<0.78 Ma). The oldest glaciations here, based on the preferred interpretation, extend well into the Pliocene (>2.58 Ma) making these among the oldest glacial sediments in North America.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Klondike area, Yukon.

00-014 **SHIMAMURA, K., FROESE, D. and JACKSON, L.E. (2000).** "Late Cenozoic geology, Ancient Pacific Margin NATMAP Project, report 1: long-baseline, dual-frequency, GPS static positioning trial, Stewart River map area, Yukon Territory." Report, Geological Survey of Canada, A2, 6p.

ABSTRACT/DESCRIPTION:
A dual-frequency GPS receiver was used to establish benchmarks along the Yukon River between Dawson City and its confluence with the White River as a field trial of this technology. Conventional static GPS occupations with long baselines (>300 km) obtained decimetre-scale accuracy in horizontal and vertical positions after post-processing. These benchmarks will be applied to a ground -penetrating radar survey of fill thickness below the Yukon River that will look for indications of recent subsidence or uplift along the river's channel.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Stewart River, Yukon.

00-015 KOTLER, C.R. and BURN, C.R. (2000). "Cryostratigraphy of the Klondike "muck" deposits, west-central Yukon Territory." Canadian Journal of Earth Sciences, 37(6): 849-861.

ABSTRACT/DESCRIPTION:
Four late Quaternary cryostratigraphic units are recognized in the unconsolidated valley-bottom deposits of the Klondike area, Yukon Territory. Three of the units, in ice-rich, loessal sediments of pre-Wisconsinan or Wisconsinan age, collectively compose the King Solomon Formation. They are overlain by a Holocene organic unit. The units are distinguished by their cryostratigraphic characteristics and oxygen-isotope ratios of included ground ice. The basal unit is the Last Chance Creek Member, a pre-Late Wisconsinan deposit, containing preserved ice wedges. The overlying Quartz Creek Member, a late Wisconsinan unit, is dominated by organic-rich loess. Massive ice is noticeably absent, although the sediments are ice rich. The isotopic composition of ice in this unit is characteristic of full-glacial conditions. An abrupt chancre to warmer and wetter conditions at the end of glaciation, prior to the Holocene, is recorded by the ice-rich, colluviated Dago Hill Member, which began accumulating. Large ice wedges originate in this unit, and, in places, penetrate the underlying full-glacial sediments. The majority of the massive icy bodies in the King Solomon Formation are ice wedges, but pool ice and aggradational ice are also exposed, especially in the Dago Hill Member. Massive icy beds formed by groundwater intrusion into permafrost occur at the lower contact of the Quartz Creek Member.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Klondike District, Yukon.

00-016 O'HARA, C. (2000). Innocent Geographies: tourism and the social construction of place in Pangnirtung, Nunavut. Conference Program, The Canadian Association of Geographers Annual Meeting 2000 Program and Abstracts, Pangnirtung, Nunavut, May 2000.

ABSTRACT/DESCRIPTION:
This paper explores how tourism is involved in the social construction of place through a case study of tourists in Pangnirtung, Nunavut. The results from qualitative interviews and participant observation carried out in Pangnirtung in the summer of 1999 will be presented. By looking at how tourists learn about a destination before and during their travel experience, this paper engages critically with claims made by proponents of ecotourism that it represents an educational form of travel. Theorization of tourism as a commodity, and the resulting commodification of place and images, paints the tourist in an overly passive and negative light. Nevertheless, even while recognizing that tourists are reflexive subjects, aware of their position as tourists, evidence from Pangnirtunq indicates that time constraints and the spatial patterns of the tourism experience limit how a tourist can learn. The evidence from Pangnirtung supports the idea that tourists learn through a series of "rumours" collected along the way. These rumours are used to construct an "innocent geography" which sometimes recognizes contradictions between (or raises questions about) marketed images and the realities of place, but which does not engage with them.

DISCIPLINE: Human Geography.

FIELDWORK LOCATION: Pangnirtung, Nunavut.

00-017 **WEST, K.D. and DONALDSON, J.A. (2000).** Evidence for winter eruption of the White River Ash (eastern lobe), Yukon Territory, Canada. Abstract, GeoCanada 2000, The Millennium Geoscience Summit Conference CD, Thematic Session, Abstract #874. May 30, 2000.

ABSTRACT/DESCRIPTION:
The White River Ash tephra deposit covers a region greater than 340,000 km2 in south-central Yukon, the western Northwest Territories, and south-east Alaska. This extensive pyroclastic deposit is the result of two volcanic eruptions from Mount Churchill in the Wrangell Mountains of Alaska. The first eruption occurred approximately 1887 years B.P. and resulted in the northern lobe of ash; the second eruption occurred approximately 1140 years B.P. and resulted in the eastern lobe of ash. Several workers have speculated on the seasonal timing of the White River Ash eastern lobe eruption, however, no direct evidence has yet linked the eruption to a particular season. Our paper provides new evidence for winter emplacement of the eastern lobe of white River Ash based on the presence of a newly-discovered airfall unit of White River Ash, preserved within a fluvial sand and gravel section. Preservation of this unit implies deposition of the ash layer during late fall or early winter, when the ash layer could have escaped reworking by high-energy fluvial currents through freezing and subsequent burial beneath snow cover. Additional sedimentological evidence for a winter eruption is provided by a similar unit of airfall ash in fluvial silt.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Central and Southern Yukon.

UNIVERSITÉ LAVAL

00-018 ARLEN-POULIOT, Y. et BHIRY, N. (2000). Paléoécologie d'une tourbière à palse du Québec nordique par les macro-restes végétaux. Présentation orale, 6e conférence nationale des étudiants en études nordiques, AUCEN, Quebec, Quebec, 5 au 7 mai, 2000.

RÉSUMÉ/DESCRIPTION:
La paléoécologie des environnements tourbeux vise à reconstituer les différentes étapes de l'évolution de ces milieux en caractérisant la faune et principalement la flore de même que leurs interactions dans ces milieux. Dans le cas de la présente étude, une tourbière à palses du Québec subarctique est étudiée précisément dans ce but. Les tourbières a palses sont des tourbières parsemées de buttes composées de matière organique dont le coeur est gelé en permanence. De par leurs caractéristiques propres (acidité, anaérobie, etc.), les tourbières constituent un excellent milieu de préservation de la matière organique. S'accumulant au fil des ans et des siècles, cette matière organique laisse les évidences des végétations anciennes et de leur succession dans le temps. Il est alors possible d'identifier les différentes étapes de la succession de la végétation en relation avec les changements climatiques. L'échantillonnage effectué a Kuujjuarapik a consisté à dégager une coupe verticale dans le matériel tourbeux d'une palse. Une coupe d'environ 2,50 m surmontant, à la base, les sédiments de la mer post-glaciaire de Tyrrell (dont le retrait s'est effectué vers 7500 B.P.) a été dégagée. Par la suite vingt tranches de 1 cm d'épaisseur ont été découpées a intervalle d'environ 12 cm. Chacun des vingt échantillons a subi alors un traitement qui consiste a le faire bouillir en ajoutant à l'eau 15 ml de KOH à faible concentration (5%). Les échantillons sont immédiatement rincés délicatement à l'eau claire. Le contenu de chacune de ces tranches est ensuite analysé en laboratoire où les pièces dignes d'intérêt sont retirées, identifiées et dénombrées. L'établissement de la tourbière a eu lieu vers 5000 BP. Trois étapes d'évolution de la tourbière ont été identifiées: marécage, tourbiére minerotrophe et tourbière ombrotrophe. La formation du pergélisol s'est effectué vers 800 ans BP.

DISCIPLINE: Écologie.

LIEU DU TRAVAIL SUR LE TERRAIN: Kuujjuarapik, Québec.

00-019 BUTEAU, S. and FORTIER, R. (2000). Penetration Rate-Controlled CPT in Permafrost. Oral Presentation, Comptes-rendus de la 53ième Conférence canadienne de géotechnique, October 2000, 2:1229-1236.

ABSTRACT/DESCRIPTION:
Conventional hydraulic pushing system used for Cone Penetration Test (CPT) controls only the load applied on the cone. This type of system is not perfectly adapted to measure the creep properties of frozen ground because it doesn't allow to control accurately very low rates of penetration and the state of strain-stress. A new linear pushing system made of two ball screws and two electrical servo-motors has been recently developed at Laval University to control accurately the penetration rate of the penetrometer in frozen ground. This system can provide constant penetration rate even at rates lower than 10-4 cm/s. The new system has been tested during the summer of 1999 in a permafrost mound in Nunavik (Qu6bec). The linear pushing system allows to study in details not only the creep properties of permafrost but also its stratigraphy. In the first case, a series of static CPTs at increasing penetration rates is performed in the same permafrost layer. From this series, the creep behaviour of permafrost layer is evaluated. In the second case, a quasi-static

CPT at a given penetration rate gives directly the stratigraphic profile of permafrost in terms of its mechanical resistance as a function of depth.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Umiujaq, Nunavik, Québec.

00-020 **PELLETIER, M. (2000).** Évaluation de l'érosion et de la sédimentation lacustre à l'aide du Pb-210 et du Cs-137 en réponse à la sur-utilisation de l'aire de mise bas du troupeau de caribous de la rivière. Présentation orale, Réunion annuelle printanière du Centre d'études nordiques, Universite Laval, 15 mai 2000.

RÉSUMÉ/DESCRIPTION:
Du bilan quantitatif de l'érosion des sols et de la sédimentation lacustre dans un bassin versant de l'aire mise bas du troupeau de caribous de la rivière George A l'aide d'isotopes à courte période (210Pb et 137Cs), il apparaît que la sédimentation au fond du lac a été très faible malgré une forte érosion dans le bassin versant. Ce faible taux d'accumulation, qu'importe le traceur choisi, serait attribuable à la nature des sédiments terrigènes érodés, essentiellernent cornposés de matière organique. Ces sédiments seraient exportés hors du bassin de drainage sous forme de matière organique en suspension et en solution. L'impact du piétinement par les caribous sur les lacs pourrait être essentiellernent écologique et n'avoir pas d'effets sédimentaires notables.

DISCIPLINE: Géographie physique.

LIEU DU TRAVAIL SUR LE TERRAIN: Lac de Caen, Québec.

00-021 **TREMBLAY, M. et BÉGIN, Y. (2000).** "The response of black spruce to climatic influence of Robert-Bourassa reservoir in northern Quebec.", Ecoscience, 7(2): 228 - 230.

RÉSUMÉ/DESCRIPTION:
L'étude a porté sur une île du deuxième plus grand réservoir du complexe La Grande en Jamésie, le réservoir Robert-Bourassa (2835 km2), endigué en 1978 et finalement rempli en septembre 1979. Des arbres (n=14) agés d'environ 100 ans ont été échantillonnés le long de deux transects perpendiculaires sur l'île. Les résultats d'une analyse densitométrique ont été comparés à deux chronologies de référence basées sur les mêmes paramètres dendrochronologiques. Les indicateurs dendrochronologiques du changement climatique local sont (1) l'absence de cernes de gel, en dépit de leur abondance ailleurs dans la région, en raison du retard de la levée de dormance relié à l'effet refroidissant du réservoir au début de l'été; (2) l'abondance de cernes pâles en réponse à des étés plus frais qu'antérieurement, (3) une haute fréquence de cernes avec du bois de compression attestant de la déstabilisation des arbres par suite de l'ouverture du fetch et d'une plus grande exposition au vent, (4) une diminution généralisée de la production ligneuse annuelle, (5) une dégradation des formes de croissance des arbres marquée par une perte foliaire massive et par la mortalité de branches, et (6) une diminution de la densité du bois, malgré l'augmentation de la proportion de bois final.

DISCIPLINE: Géographie physique.

LIEU DU TRAVAIL SUR LE TERRAIN: Radisson, Québec.

00-022 **TULLOCH, S. (2000).** La perte de la langue retombées identitaires. Présentation orale, Colloque Nord-Laval, Universite Laval, Avril 2000.

RÉSUMÉ/DESCRIPTION:
Les changements culturels survenus chez les communautés Inuit sont accompagnés d'un déclin de l'usage de la langue ancestrale inuit. Devant la menace de la perte de leur langue et l'augmentation de l'usage de l'anglais, beaucoup d'Inuit se questionnent sur l'importance de leur langue, l'inuktitut. Faut-il la protéger et Pourquoi? Des entrevues semi-dirigées ont été réalisées auprès d'un échantillon représentatif de la population d'Iqaluit. Elles ont fait ressortir les préoccupations des personnes interrogées a l'égard de leur langue, ainsi que les liens qu'elles tracent entre leur langue et leur identité. Les participants expliquent que parler l'inuktitut fait partie de ce qu'ils sont en tant qu'Inuit. Leurs commentaires directs et indirects suggèrent que la langue inuit est importante pour l'identité inuit parce qu'elle fait partie de la tradition et qu'elle est pour eux une ressource, un outil, qui permet de créer, développer, maintenir ou même nier l'identité inuit. La langue, marqueur d'identité, sert donc inclure ou à exclure d'autres membres de la communauté. Aussi, la langue aide et forger et maintenir le réseau social. En somme, les données recueillies tendent a démontrer qu'en ce moment, la perte de la langue ancestrale a des retombées identitaires sur les Inuit d'Iqaluit.

DISCIPLINE: Linguistique.

LIEU DU TRAVAIL SUR LE TERRAIN: Iqaluit, Nunavut.

00-023 **TULLOCH, S. (2000).** The future of Inuktitut in Nunavut. Oral Presentation, CAUAPLA Joint Panel on Minority Languages, 26 mai 2000.

ABSTRACT/DESCRIPTION:
The Inuit living in the territory of Nunavut seem to have a unique opportunity to take concrete measures to reverse the trend of ancestral language loss due to the political independence that this de facto Inuit territory obtained in April 1999. In order to present what the creation of Nunavut means for the future of Inuktitut, this paper first outlines the situation of Inuktitut in Nunavut leading up to the inauguration of the new territory. It then shows what the creation of Nunavut has meant in the short term for the preservation, protection and promotion of Inuktitut. Finally, it presents speculation on what the creation of Nunavut may mean in the long term for the future of Inuktitut, discussing the limits of legislation and the factors which may limit public and private initiatives, expounding on the pertinence and significance of language attitudes. The territory of Nunavut, where the majority of the electorate speaks Inuktitut, provides a unique forum in which to observe the limits and possibilities for language planning for Canada's aboriginal languages.

DISCIPLINE: Linguistics.

FIELDWORK LOCATION: Iqaluit, Nunavut.

MCMASTER UNIVERSITY

00-024 CAREY, S.K. and WOO, M.K. (2000). "The role of soil pipes as a slope runoff mechanism." Journal of Hydrology, 233:206-222.

ABSTRACT/DESCRIPTION:
Pipeflow in subarctic slopes provides a preferential runoff mechanism that bypasses the soil matrix, rapidly conveying water to the stream. Extensive soil piping occurs in the central Wolf Creek basin, Yukon, at the interface of the organic and mineral horizons. Flow in these pipes are ephemeral, transmitting water only when the water table is within or above the zone where pipes occur. During snowmelt, pipeflow began several days after the onset of surface runoff. Pipeflow contribution increased until ground thaw lowered the water tables, leaving matrix flow within the organic layer as the dominant mode of runoff. Pipeflow accounted for 21% of runoff during the 15 day melt period of 1997. Following melt, pipeflow recurred only during two intense summer rainstorms, each yielding different pipeflow response characteristics. During melt, pipeflow closely followed the daily snowmelt cycles and responded earlier than the integrated slope runoff. In the summer, pipeflow hydrographs rose and fell much quicker than direct storm runoff from the entire slope, which was dominated by fast matrix flow within the organic layer. Pipeflow contributing areas were relatively small, but their extent changed with hillslope wetness. Analysis revealed that the Manning flow formula can be combined with contributing areas to simulate pipeflow discharges. Unlike temperate environments where frozen ground is not a factor, the frost table position significantly controls the position of the phreatic surface, and must be considered in any models of pipeflow in permafrost slopes.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Wolf Creek Basin, Yukon.

00-025 GRIFFIS, T.J. (2000). Inter-annual variability of net ecosystem CO2 exchange at a subarctic fen. Ph.D. Thesis, Department of Philosophy, McMaster University, April 2000.

ABSTRACT/DESCRIPTION:
This thesis examines the inter-annual variability in growing season net ecosystemC02 exchange (NEE) at a subarctic sedge fen located near Churchill, Manitoba, Canada. Landscape-scale NEE and the energy and water balance of the fen were studied during five growing seasons between the years 1994 and 1999. Inter-annual variability in N EE was large and ranged from a net source to the atmosphere and a net sink to the ecosystem. Estimates of landscape-scale gross ecosystem production (GEP) and ecosystem respiration (ER) indicate that GEP is largely responsible for the inter-annual variability in NEE. Annual estimates of NEE indicate that, during the present period, the fen is losing carbon nearly three times faster than its long-term historical accumulation rate of approximately -11g CO2 m-2 y-1. The position of the polar jet stream and synoptic scale weather patterns has an important control on the timing of snowmelt, leaf emergence, and development of the vegetation during early spring. The 1997-1998 El Nino phenomenon caused a warm and wet spring that lengthened the growing season and increased carbon acquisition at the fen. Spring season hydroclimatological conditions play a key role in determining the source and sink strength of the wetland. Community-scale NEE measurements revealed that sedge-moss communities account for the majority of the C02 exchange at the fen. Community relationships of GEP and ER indicate that changes in community spatial distribution within the fen could nearly triple the net carbon acquisition

of this wetland. Model simulations show that the sensitivity of NEE to changing environmental conditions varies inter-annually depending on the initial conditions of the wetland. Simulations using climatic change scenarios indicate that warmer air temperatures will increase carbon acquisition during wet years but may act to reduce wetland carbon storage in years that experience a large water deficit.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Churchill, Northern Manitoba.

00-026 LEENDERS, B.A. (2000). Subalpine shrubland and open woodland in the subarctic. M.Sc. Thesis, McMaster University, September 2000.

ABSTRACT/DESCRIPTION:
The hydrologic connectivity between landscapes in runoff contributions to streamflow is poorly understood. In addition, connectivity in hydrological models is not often part of model design. This study investigated the hydrologic connectivity between subalpine shrubland and open woodland in subarctic Yukon during the melt season of 1999. Four methods were used to determine key runoff generating processes and to quantify the magnitude of lateral flow across the treeline: 1) Direct measurement of lateral flow in the organic soil matrix and surface flow, and calculated flow in the mineral soil; 2) Comparative water balances between the two landscapes; 3) Simulation of the 1999 field season using a hydrological model to verify the key processes; and 4) Simulation of other possible conditions, ie. snowmelt rate, snowpack-water equivalent and ground ice content, to determine the representativeness of the 1999 data. The 1999 field season revealed a weak hydrologic linkage between the two landscapes. Direct measurements showed that the organic soil provided the main conduit for meltwater delivery across the treeline. However, the majority of meltwater was absorbed by the mineral soil, which contained little ground ice. The water balances of the two landscapes were similar in that the majority of meltwater went to soil moisture recharge and lateral flow measured in the organic soil was of the same magnitude. These results were also confirmed by the model simulation of the 1999 season for the shrubland. The simulation of other possible conditions in the shrubland revealed that the volume of ground ice in the mineral soil played a key role in the magnitude of lateral flow above the mineral soil and that organic soil plays a minor role in the generation of this lateral flow. These findings point to the important effects of ground ice content in the vertical water balance. The hydrologic connectivity between landscapes may also become important if the downslope landscape has an increased capacity to absorb meltwaters compared to the source landscape, thus reducing the amount of meltwater that can reach the stream.

DISCIPLINE: Hydrology.

FIELDWORK LOCATION: Yukon.

00-027 SPENCE, C.A., PIETRONEIRO, A. and WOO, M.K. (2000). Hydrologic Investigation of a Canadian. Workshop Proceedings, 5th Annual Proceedings, MAGS, pp.125-127.

ABSTRACT/DESCRIPTION:
The objectives of the project are twofold. First to expand the database of information on those processes relevant to northern Canadian Shield hydrology such as spring snowmelt, active layer dynamics, wetland hydrology and lake storage. Secondly, to test hydrologic models of streamflow using the improved database and compare these model results to estimates from linked hydrologic/atmospheric models developed in MAGS. This will

provide key validation results for MAGS.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Yellowknife, N.W.T.

MEMORIAL UNIVERSITY

00-028 GOUDIE, R.I. (2000). Foraging Ecology and offspring growth rates of Great Black-backed Gulls at Gull Island, Newfoundland and the Gannet Islands, Labrador. Oral Presentation, ACWERN Meeting, Huntsman Marine Science Centre, October 14, 2000.

ABSTRACT/DESCRIPTION:
Competition can be based on temporal and/or spatial food source limitations to individuals. Great Black-backed Gulls (*Larus marinus*) are generalist predators, feeding on intertidal invertebrates; smaller birds and mammals; the food of, and the young of other breeding seabirds and waterfowl; carrion; and human refuse. Both Gull Island and the Gannet Clusters are rich in prey items but Gull Island has nearby sources of human refuse. In addition to nearby dumps Gull Island has a population of breeding Herring Gulls (*Larus argentatus*) which outnumber the Great Black-backed Gulls approximately thirty-to-one. All Great Black-backed Gulls fed their chicks seabirds (mostly auk eggs) in the Gannet Islands, while on Gull Islands, adults fed chicks seabirds (mostly adult puffins, kittiwakes and petrels), and/or garbage. Among adults that fed their chicks seabirds, chick growth rates (up to 22 days of age) were faster on the Gannet Islands than on Gull Island. Further, on Gull Island, chicks fed seabirds tended to grow faster than chicks fed garbage. We suggest competition on Gull Island has forced adults to work harder to get seabirds, or to feed on easily accessible, but less nutritious garbage, resulting in smaller chicks with lower growth rates.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Gannet Islands, Labrador.

00-029 FARAHANI, E., BASSFORD, M.R. and STRONG, K. (1999). Ground-Based Measurements of the Arctic Stratosphere from Eureka. Poster presentation, 6th National Student Conference on Northern Studies, Québec, Québec, May 5-7, 2000.

ABSTRACT/DESCRIPTION:
Stratospheric ozone depletion leads to increases in solar ultraviolet radiation at the Earths surface which can damage natural ecosystems. The discovery of the Antarctic "ozone hole" and later observations of mid-latitude ozone loss prompted a reassessment of our understanding of ozone chemistry. In the Arctic, the springtime ozone column has suffered unusually high rates of depletion during the 1990s. There is significant interest in the magnitude of and mechanisms for Arctic ozone destruction, particularly as models predict that it could be further enhanced over the next few decades by increasing accumulations of greenhouse gases such as C02 which act to cool the stratosphere. In order to assess the accuracy of such model predictions and to elucidate the destruction pathways, we are using a ground-based spectrometer 0 deployed at Environment Canada's Arctic Stratospheric Observatory (ASTRO), located at Eureka, NT. The main component of our instrument is a UV-visible grating spectrometer fitted with a charge-coupled device detector, housed in a weatherproof aluminum trunk. This is used to record absorption spectra from which vertical column amounts of ozone, N02, BrO, OCIO, and N03 can be retrieved. This instrument was successfully deployed in two field campaigns: at Vanscoy, SK in August 1998 and at Eureka, NT from March to May 1999. During both of these campaigns, the instrument was operated in zenith-sky mode, recording spectra of scattered sunlight, which were analyzed using differential optical absorption spectroscopy. The instrument will again be deployed at Eureka from February through May 2000, and will include a new feature, a star-tracking telescope, optically coupled to the spectrometer in order to allow measurements of the target gases during polar night. With the combination of stellar and solar observations, we will be able to monitor stratospheric composition during the crucial winterspring period when the conditions leading to ozone loss develop. These measurements will expand the range of stratospheric gases monitored at Eureka and furnish new information on polar ozone destruction. This presentation will describe the instrumentation and the analysis technique, and will discuss results from the Eureka campaigns.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Eureka, Nunavut.

00-030 MARQUETTE, G., GRAY, J.T., COURCHENE, F. and GOSSE, J. (2000). Studies on felsenmeer-covered surfaces in the Torngat Mountains, Northern Québec-Labrador. Abstract, 30th International Arctic Workshop, Program and Abstracts, March 3, 2000.

RÉSUMÉ/DESCRIPTION:
Le projet a pour but d'utiliser les données de terrain, la cartographie des felsenmeers ainsi que leurs caractéristiques pédologiques afin d'améliorer le modèle d'inlandsis recouvrant la péninsule du Québec -Labrador pour la dernière glaciation. Cette présentation a démontré les résultats préliminaires du projet. Premièrement, trente sommets visités en été 1999, sur un transect est-ouest dans le nord des Monts Torngat, ont permis de classer les surfaces étudiées en: zones de felsenmeer, zones de transition (zones comprenant des évidences glaciaires de même que des felsenmeers naissants). Une image Radarsat, f2a (mode fin à résolution de 10m), une image Landsat TM (à résolution de 30m) ainsi qu'un

Modèle Numérique de Terrain (MNT) ont été utilisées pour étudier le potentiel des images pour détecter les felsenmeers de par leur texture, leur rugosité importante et leur altitude. En essayant de distinguer les surfaces de felsenmeers avec celles de fond de vallée et des dépôts glaciaires, Putilisation d'images satellitaires pour la cartographic du nord devient intéressant à une échelle régionale. Dans un deuxième temps, les résultats pédologiques d'un sommet couvert de felsenmeer et de sa zone de transition ont permis de dénoter une altération différencielle. Ainsi, le felsenmeer de ce sommet présente une minéralogie (présence de gibbsite, une argile secondaire) d'altération plus longue que la zone de transition comprenant principalement des minéraux primaires. L'étude des felsenmeers montre ainsi un intéret pour le développement de l'histoire glaciaire de la région côtière des Torngat.

DISCIPLINE: Géographie physique.

LIEU DU TRAVAIL SUR LE TERRAIN: La vallée Alluviaq, Quebec/Labrador.

UNIVERSITY OF NEW BRUNSWICK

00-031 ALLARD, K. (2000). Common Eider (*Somateria mollissima*) Duckling predation by Herring Gulls (*Larus argentatus*) during colony departure. Poster Presentation, North American Waterfowl Conference, Saskatoon, Saskatchewan, October 15, 2000.

ABSTRACT/DESCRIPTION:
Attempts to quantify brood departure activity and predation during the nest-to-sea portion of the eider breeding season are often hindered by vegetation, darkness and human disturbance. The present study, initiated in 1999, takes place at a remote eider colony in the eastern arctic, where the Canadian Wildlife Service has established blinds equipped with tunnels for discrete observation of breeding birds. Brood departures from the colony may be partially constrained by presence of predators, tide, wind and luminosity. Herring gulls are known predators of eider ducklings in the Eastern Arctic. If high winds provide an advantage to herring gulls by increasing their ability to hover and attack, then gull air patrol activity and duckling predation should be greater during windy periods. Broods travel distances sometimes exceeding 200m, often over boulders and/or through vegetation, in order to reach the sea. Low light makes visual contact between hens and ducklings difficult, and foraging ability on the water may be impeded, especially for young, inexperienced ducklings. Departure activity should vary diurnally, slowing when darkness or surf stalls departing broods. A trade-off may exist between their ability to maintain visual contact, forage efficiently, tides, favourable weather conditions for departure, and risk of predation by gulls.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: East Bay, South Hampton Island, Nunavut.

UNIVERSITY OF OTTAWA

00-032 HUGENHOLTZ, C.H. (2000). Active-layer detachment slides near Kluane Lake, YT. Paper, Conference Proceedings, 6th National Student Conference on Northern Studies, Quebec, Quebec, 6-7 May 2000 .

ABSTRACT/DESCRIPTION:
This paper reports oil six recent active-layer detachment slides and the results of a small ground heating experiment undertaken on an alpine plateau near Kluane Lake, Yukon Territory. Several recent active-layer detachment slides were found above treeline on north-, northeast- and west-facing slopes characterized by matrix-supported diamictons, and well developed organic mats. Late-summer probing confirmed the presence of permafrost. The landslides occur on slopes ranging from to 13-18 and they range in length from 12-72 m and in width from 6-64 m. The morphology of some of the landslide scars suggests a complex failure history resulting in retrogression. Scar depths are noticeably shallower than the active layer on slopes immediately adjacent to the slide scars, suggesting that failure occurred before maximum thaw. A small ground heating experiment was undertaken in the summer of 1999 in order to test the importance of surface heating as an initiating mechanism for the landslides. Sliding did not occur and the data suggest that intense surface heating alone cannot explain the occurrence of active-layer slides at this locality due to low soil-ice content in late-summer and the insulating property of a thick (> 15 cm) organic mat. It is believed that rapid snowmelt and/or intense pluvial events are required to sufficiently raise the pore water pressure and reduce the shear strength to trigger a detachment.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Kluane Lake, Yukon.

QUEEN'S UNIVERSITY

00-033 BEIERLE, B.D., LAMOUREUX, S. et. al. (2000). Decomposition of Sediment Grain Size Distributions as a Paleolimnological Proxy Record. Poster Presentation, 8th International Paleolimnology Symposium, Queen's University, August 20, 2000.

ABSTRACT/DESCRIPTION:
Conventional uses of sediment grain size data as a proxy of paleoenvironmental processes are usually restricted to simple statistical descriptions of the particle size distribution (PSD) (e.g. mean, median and mode).These descriptions provide only a limited indication of down-core changes in depositional conditions and processes, and in some cases, can be misleading. For example, the arithmetic mean and median are not descriptive of PSD, especially where the PSD is asymmetric or multi-modal. In contrast, response surface plots of grain size data allow intuitive interpretation of the characteristics of the entire PSD and can provide important insights into depositional processes and changing environmental conditions. Using examples from a variety of lacustrine depositional environments, we demonstrate the utility of this approach to characterize sediment input processes and changes in depositional setting. This method is especially useful for distinguishing between discrete event deposits and productivity hiatuses that are frequently interpreted as paleoclimatic oscillations. A similar approach can be applied to characterizing subannual events contained within varved sediments. This approach can be used in most depositional environments, over a wide range of timescales, and in combination with other proxy methods, furthers the paleoenvironmental interpretation of clastic and organic depositional processes in lake sequences.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Yukon, Nunavut, Northern B.C.

00-034 BEIERLE, B.D. (2000). Holocene history of the Chapman Lake area, Yukon Territory, Canada. Conference Proceeding, 8th International Paleolimnology Symposium, Queen's University, August 20, 2000.

ABSTRACT/DESCRIPTION:
Detailed macrofossil, geochemical, grain size and sediment flux rates from a suite of cores from Chapman Lake, YT are used to define three major phases of climate during the past 10,000 years. The early Holocene, from ca. 10,000 to 7500 BP is characterized by relatively high lake productivity indicating warmer conditions. Organic carbon values declined sharply at ca. 7500 BP, reaching a minimum at ca. 5500 BP and remaining low until ca. 1600 BP. Charophyte oogonia disappeared from the record at this time, and were replaced by abundant bryophyte fragments after 5500 BP. Decreased lake productivity suggests cooler conditions, with the increased abundance of moss due to either greater growth rates or improved preservation. Grain size and clastic sediment flux increased after ca. 5500 BP suggesting more and coarser sediment was brought into the lake during this interval through episodic eolian activity. A sharp increase in productivity and decreased abundance of moss macrofossils between ca. 1600 and 600 BP suggests warmer, dryer conditions during this time, which may be correlative to the Medieval Warm Period. Clastic flux began to increase at ca. 900 BP, with an abrupt decline in productivity at ca. 600 EP. This period of increased clastic flux and decreased productivity may be correlative to the late Neoglacial and Little Ice Age.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Chapman Lake, Yukon.

00-035 BEIERLE, B.D. (2000). Late Glacial-Early Holocene Landscape Evolution of the Chapman Lake Area, Yukon Territory, Canada. Conference Proceeding, 30th International Arctic Workshop, March 15, 2000.

ABSTRACT/DESCRIPTION:
Detailed sedimentological, geochemical and macrofossil analysis of two lake sediment cores from Chapman Lake, Yukon are used to reconstruct landscape change in the Blackstone River Valley (BRV) over the past 13,0 00 years. Chapman Lake is the largest of a group of kettle lakes, and is currently a closed basin perched 10 m above present base level in the BRV. A layer of plant detritus and overbank sediments in the cores overlies a fluvial sand facies and is inferred to represent the land surface prior to subsidence of the lake basin after 13,210 +/- 300 BP. Fluvio-lacustrine sediments deposited after this time fine upward and increase in LOI organic carbon, suggesting decreasing fluvial influence on Chapman lake until ca. 11,000 BP when clastic sedimentation drastically decreased and LOI organic carbon increased from <5 % to >40 %. Correlation to dates from a previous study of Chapman Lake as well as dates from this study suggest that net sedimentation rates decreased by a factor of 3 at this time, and indicate that the lithofacies change resulted mostly from decreased clastic sedimentation despite increased lake productivity.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Chapman Lake, Yukon.

00-036 GOMBAY, N. (2000). "The politics of culture: Gender parity in the legislative assembly of Nunavut." Etudes/Inuit/Studies, 24(l): 125-148.

ABSTRACT/DESCRIPTION:
In 1997, the people of Nunavut rejected, by public plebiscite, a proposal that there be gender parity in the legislative assembly of Nunavut. Under the proposal, each electoral district was to have sent one male and one female representative to the assembly. In discussing the results of the plebiscite on gender parity, this paper will trace the roots of the vote: first, by looking at the political foundations of Nunavut which led up to the gender parity proposal; second, by discussing the various cultural forces at play which generally influenced Inuit voting patterns; finally, by analyzing changes in Inuit identity, gender roles, and systems of governance. The paper concludes with an analysis of the outcome of the vote on gender parity based on fluid perceptions of culture and 'tradition'.

DISCIPLINE: Human Geography.

FIELDWORK LOCATION: Nunavut.

00-037 GREGORY-EAVES, I. SMOL, J.P., and FINNEY, B.P. et. al. (2000). "A diatom-based transfer functions for inferring past climatic and environmental changes in Alaska." Antarctic, and Alpine Research,13(4):353-365.

ABSTRACT/DESCRIPTION:
Surface sediment diatom assemblages from 51 Alaskan lakes, distributed along a north-south transect, were enumerated in order to develop transfer functions that could be used to make inferences of past climatic and environmental change. Environmental variables that were found to be the strongest predictors of the diatom assemblages, identified

through Canonical Correspondence Analyses, were ionic and nutrient concentrations, as well as lake depth. A number of weighted-averaging (WA) regression-calibration techniques were employed to develop transfer functions for lake-water conductivity, total phosphorus concentration, and lake depth, but simple WA with classical deshrinking produced the most robust models for all variables. The strength of these models (r2boot ranged between 0.52 and 0.53) is comparable to those generated from other northern calibrations studies. Application of our models to fossil diatom assemblages could provide information on the magnitude of past environmental change, and may serve as a basis for assessing anthropogenically induced impacts.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Alaska.

00-038 GREGORY-EAVES, I., SMOL, J.P., and FINNEY, B.P. (2000). "Characteristics and variation in lakes along a north-south transect in Alaska." Hydrobiology, 147(2): 193-223.

ABSTRACT/DESCRIPTION:
Environmental measurements from 51 Alaskan lakes, distributed along a north-south transect, were collected to explore the influence of a climatic and vegetational gradient, as well as to provide baseline limnological data. Most lakes were dilute and circumneutral to alkaline, but broad ranges were apparent in total phosphorus, and dissolved organic carbon. ANOVA and Tukey testing, along with multivariate analyses, detected significant differences in ionic and nutrient concentrations between ecozones. Northern forest lakes tended to have higher concentrations of nutrients and ions relative to arctic tundra and southern forest lakes. The contrast in water chemistry between northern forest and arctic tundra lakes is likely due to differences in climatically-influenced factors (i.e. permafrost and vegetation, as well as decompositional and hydrological processes), whereas catchment characteristics and precipitation appear to explain the water chemistry differences between northern forest and southern forest lakes. A comparison of water chemistry results among circumpolar tree line regions confirmed that the differences in major ion concentration between arctic tundra and boreal forest lakes is a widespread trend.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Alaska.

00-039 FINNEY, B.P., GREGORY-EAVES, I. and SWEETMAN, J. et. al. (2000). "Impacts of climatic change and fishing on Pacific salmon-abundance over the past 300 years." Science, 290: 795-799.

ABSTRACT/DESCRIPTION:
The effects of climate variability on Pacific salmon abundance are uncertain because historical records are short and are complicated by commercial harvesting and habitat alteration. We use lake sediment records of d 15N and biological indicators to reconstruct sockeye salmon abundance in the Bristol Bay and Kodiak Island regions of Alaska over the past 300 years. Marked shifts in populations occurred over decades during this period, and some salmon returns due to climate or harvesting can have strong impacts on sockeye nursery lake productivity in systems where adult salmon carcasses are important nutrient sources.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Alaska.

00-040 HAY, M.B., MICHELUTTI, N., and SMOL, J.P. (2000). "Ecological patterns of diatom assemblages from Mackenzie Delta lakes, Northwest Territories." Canadian Journal o f Botany, 78(1):19-33.

ABSTRACT/DESCRIPTION:
Sediment samples were collected from 77 lakes in the Mackenzie Delta representing a gradient of lakes from those having continual connection with the sediment-laden Mackenzie River to lakes having connection for only a couple of days every few years. Diatom assemblages in all lakes were dominated by a diverse benthic microflora, primarily from the genera *Navicula* and *Nitzchia* . Maximum relative abundance of the dominant taxon at all sites was less than 30%, and most taxa did not dominate in more than one or two lakes. Delta lake assemblages were distinct from diatom assemblages associated with other regional transects of upland tundra and forest lakes. Detrended correspondence analysis showed that nonmotile epiphytic genera, such as *Coconeis* and *Gomphonema*, were more common in lakes having a lower influence from the Mackenzie River, reflecting the extensive macrophyte growth within these lakes. Species diversity decreased as macrophyte production increased. Taxa responses along this macrophyte production gradient were modeled using partial least squares regression. Diatoms were sensitive to the degree of river influence, and the related biological and limnological changes, suggesting assemblages can provide an indication of hydrological variability within Mackenzie Delta lakes.

DISCIPLINE: Limnology.

FIELDWORK LOCATION: Mackenzie Delta, N.W.T.

00-041 HOLDER, K., MONTGOMERIE, R. and FRIESEN, V.L. (2000). "Glacial vacariance and historical biogeography of rock ptarmigan (*Lagopus mutus*) in the Bering region." Molecular Ecology, 9:1265-1278.

ABSTRACT/DESCRIPTION:
In this paper, we address alternative hypotheses for the evolution of subspecies of rock ptarmigan (*Lagopus mutus*) endemic to the Aleutian Archipelago. To do this we examined patterns of genetic differentiation among populations of rock ptarmigan in the Aleutian Islands and parts of both Alaska and Siberia. Variation in mitochondrial control region sequences of 105 rock ptarmigan from 10 subspecies within the Bering region revealed three major phylogenetic lineages, two of which are endemic to the Aleutian Islands. Accordingly, haplotype and nucleotide diversities of rock ptarmigan within the archipelago are much higher than within mainland Alaska or Siberia. For Aleutian rock ptarmigan, analyses of molecular variance indicated significant genetic structuring and low estimates of gene flow among populations, despite small interisland distances within the archipelago. However, isolation by distance did not describe the pattern of gene flow of differentiation at this scale. Our estimates of divergence times of lineages suggest that Aleutian rock ptarmigan became isolated prior to the most recent Pleistocene glaciation event (late Wisconsin Stade) ant that current patterns of genetic variation reflect the postglacial redistribution of divergent lineages and subsequent limited gene flow. In addition, genetic divergence among lineages was concordant with the distribution of plumage types among subspecies.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Aleutian Islands, Alaska.

00-042 **LEWIS, T. (2000).** Hydrometerorology and lacustrine sedimentary processes at Bear Lake, Devon Island, Nunavut. M.Sc. Thesis, Department of Geography, September 2000, Queen's University.

ABSTRACT/DESCRIPTION:
A lacustrine process study was undertaken at Bear Lake, Devon Island, Nunavut from May 22 to August 19, 1999. Air temperature, precipitation, water temperature, mass accumulation rates (MARs), discharge and bottom currents were monitored in an attempt to spatially and temporally characterize lacustrine processes and the sedimentary response to environmental forcings. Air temperature datasets reveal that the Bear Lake record is statistically significantly related to records from Resolute and Eureka. Bear Lake is warmer than both these stations, though it is likely that Bear Lake thermistors were improperly shielded from solar radiation artificially elevating temperatures. This project serves to improve the understanding of sedimentary processes in High Arctic glacial lakes, and to more confidently interpret the paleoenvironmental record. It is part of a larger research project at Bear Lake, which includes the analysis of sediment cores and a sub-bottom acoustic survey.

DISCIPLINE: Geography.

FIELDWORK LOCATION: Bear Lake, Devon Island, Nunavut

00-043 **LEWIS, T., GILBERT, R. and LAMOUREUX, S. (2000).** Processes of climatic sedimentation at Bear Lake, Devon Island. Poster Presentation, 30th International Arctic Workshop, March 16, 2000.

ABSTRACT/DESCRIPTION:
A detailed study of the processes controlling clastic sedimentation in an arctic lake was carried out at Bear Lake, Devon Island in 1999. Lake level was recorded from June 16 to August 18. Steam stage and flow were measured at the outlet. From this the inflow was calculated. Suspended sediment was captured with baffled con-shaped traps. Twelve arrays were placed throughout the lake with either two or three traps per array. Each trap was collected weekly or bi-weekly. Mass accumulation varied from 0.04 g/m2 per day to 57.7 g/m2 per day at a delta-proximal site during a period of high glacial melt. Aeolian transport was assessed by monitoring a sand dune on the lake ice as it was released into the lake by melt. A sediment trap array moored under the sandy area had the densest accumulation of sediment. From June 23 to July 21, when other trap sites were experiencing sediment focusing and underflows, the array under the dune experienced extraordinarily high accumulation. It is hypothesized that the sand spread laterally with depth and mixed with less turbid water.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Devon Island, Nunavut.

00-044 **MOSER, K.A., KORHOLA, A.,WECKSTROM, J. et. al. (2000).** A paleohydrology inferred from diatoms in northern latitude regions." Journal of Paleolimnology, 24: 93-107.

ABSTRACT/DESCRIPTION:
Several recent studies have successfully applied diatom-based paleolimnological techniques to infer past hydrological changes in arctic and subarctic regions. For example, we summarize arctic studies that attempt to determine changes in peat water content, flood frequency, river discharge, effective moisture and ice cover in northern regions. Some of the investigations are still in preliminary stages, but represent innovative approaches to study arctic and subarctic paleohydrology. New data demonstrate that lake depth, which may be related to changing hydrological conditions, is a significant variable influencing the distribu tions of diatom taxa in lake surface sediment calibration sets from Wood Buffalo National Park (WBNP), on the border of Alberta and the Northwest Territories, Canada, and from Fennoscandia (mainly northwest Finland). Weighted averaging regression and calibration methods were used to develop quantitative inference models for lake depth using diatom assemblages preserved in surface sediments. The predictive abilities of the transfer functions were relatively high (for WBNP r2 = 0.70 and RMSE 1.8 m). However, evaluating the transfer functions using jack-knifing procedures indicated lower predictive abilities, possibly reflecting the relatively small sample size and/or short gradients used in these calibration sets. Such transfer functions can be used to track overall trends in lake levels, especially those related to climate change, must be made cautiously and must include some understanding of the local, present-day hydrological system.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Circumpolar Arctic.

00-045 MOSER, K.A., KORHOLA, A. and WECKSTROM, J. (2000). "Response of diatoms and other siliceous indicators to the developmental history of a peatland." Arctic, Antarctic, and Alpine Research, 32(2):167-178.

ABSTRACT/DESCRIPTION:
Diatoms and other siliceous microfossils were examined from a 386-cm-long peat core, covering the last ca. 7200 yr, from north-central Siberia to gain insights into peatland developmental history, and to explore the potential of diatoms as proxy indicators in arctic peats. Diatom analyses of arctic peatlands are rare, and so one aspect of this study was to examine the sensitivity of diatom taxa in relation to independent paleoindicators already described from this core. Changes in the relative abundances of diatom taxa divided the core into four zones that closely tracked the ontogeny of the peatland from an open water environment (Zone 1: benthic, alkaliphilic taxa), followed by fen environments (Zones II and III: epiphytic, acidophilic taxa), and fi nally to a better-drained, high-centered bog (zone IV; aerophilic taxa). In addition to the diatom taxa, observations were made on the relative abundances of siliceous protozoan plates, chrysophyte cysts, and phytoliths. Both the diatoms and these other siliceous microfossils appeared to respond to changes in hydrology and moisture, as well as to fire episodes likely triggered by climate change. This study demonstrates that diatoms and other siliceous microfossils from arctic peat deposits provide an important source of paleoenvironmental information that can strengthen interpretations derived from other commonly used indicators.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Siberia, Russia.

00-046 **PACHECO, N. (2000).** A molecular investigation of hybridization in Alaskan Brachyramphus Murrelets. B.Sc. Thesis, Department of Biology, May 2000, Queen's University.

ABSTRACT/DESCRIPTION:
Behavioural observations suggest that the North American sister species of Brachyramphus murrelets may be hybridizing in Alaska. As Marbled Murrelets (*B. Marmoratus*) and Kittlitz's Murrelets (*B. Brevirostris*) have been recognized as "endangered" or "threatened" through much of their range, information about introgressive hybridization is crucial in designing an appropriate conservation strategy. In this study, individuals from both species were collected from an area of sympatry and screened for evidence of hybridization. Genetic variation was assayed using SSCP analysis and direct sequencing of six nuclear introns and a segment of the cytochrome b gene. The two species did not share any alleles or haplotypes, indicating that no F1 ($p < 0.001$) or F2 ($P = 0.016$) individuals were present among the sampled individuals. Phenetic analysis of allele and haplotype sequences indicated that the two species represented separate evolutionary lineages. Sequence analysis of cytochrome b suggested an estimated divergence of 3.2 million years before present between Marbled and Kittilitz's Murrelets. They are distinct species under both the biological species concept and the phylogenetic species concept.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Alaska.

00-047 **PATIRANA, A. (2000).** Evolutionary and conservation genetics of kittiwakes *(Rissa spp.)*. M.Sc. Thesis, Department of Biology, Queen's University, May 2000,.

ABSTRACT/DESCRIPTION:
I studied the populations genetics of species within the genus Rissa using mitochondrial DNA (mtDNA) control region and nuclear intron genetic markers. I used genetic data to define management units (MU's) for conservation in red-legged kittwakes (*R. brevirostris*) and to describe the evolutionary genetics of black-legged kittiwakes. MtDNA control region variation indicated that red-legged kittiwake colonies are genetically differentiated and constitute separate MU's. Phylogenetic analyses suggested that this species probably underwent a recent population bottleneck or expansion following the retreat of the Wisconsin glaciers. MtDNA control region and nuclear intron variation indicated that Atlantic and Pacific populations of black-legged kittiwakes (*R. tridactyla*) are genetically distinct. Genetic divergence among haplotypes suggested that differentiation of these populations probably occurred due to glacial vicariance in the late Pleistocene. Colonies in the Atlantic were significantly genetically differentiated from one another, possibly due to low long-term female effective population sizes (Ne) and restricted contemporary gene flow (resulting from philopatry to breeding sites). morphological variation in Atlantic colonies appeared to be recently evolved, possibly representing primary intergradation.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Circumpolar Arctic.

00-048 **POLAND, V. (2000).** Genetic population differentiation in pigeon and spectacled guillemots. B.Sc. Thesis, Department of Biology, May 2000, Queen's University.

ABSTRACT/DESCRIPTION:
Pigeon and spectacled guillemots (*Cepphus columba* and *C. carbon* respectively) are natally philopatric seabirds that nest in small colonies on the Pacific coast of North America and northern Asia. The Exxon Valdez Oil Spill in Prince William Sound caused a decrease in population size of pigeon guillemots in the region, and populations have still not recovered. For conservation purposes, the genetic structure of the populations needs to be determined and management units need to be defined. Variation in the mitochondrial DNA control region was analysed for 159 pigeon guillemots from two subspecies, *C. c. andianta* and C. *c. eureka*, and for 12 spectacled guillemots. Most haplotypes were private and most regions were highly differentiated. Using F-statistics, a division of pigeon guillemots into three groups (Alaska, British Columbia and Oregon/California) was found to best represent the mitochondrial data. This does not agree with the current taxonomy. Spectacled and pigeon guillemots appear to be reciprocally monophyletic which suggests that they are reproductively isolated. Populations appear to be in equilibrium between mutation and drift with gene flow occurring in a predominantly northwesterly direction. Pigeon guillemots from three groups (Alaska, British Columbia and Oregon/California) are thought to represent separate management units. Nuclear data are needed to confirm these results.

DISCIPLINE: Biology.

FIELDWORK LOCATION: Circumpolar Arctic.

00-049 STEWART, K., GREGORY-EAVES, I. et. al. (2000). "Covariation among Alaskachrysophyte stomatocyst assemblages and environmental gradients: A comparison with diatom assemblages." Nord. Journal of Botany, 20: 357-368.

ABSTRACT/DESCRIPTION:
Northern lakes, for which we have little long-term data are pred icted to experience profound impacts with greenhouse warming. In order to assess the usefulness of chrysophytes as paleoenvironmental indicators, stomatocysts were enumerated from the surface sediments of 51 Alaskan lakes distributed along a strong climatic gradient. A total of 142 cyst morphotypes were described using light microscopy, of which 13 are believed to be new forms. Principal components analysis of the stomatocyst assemblages showed a limited amount of variation (?1 = 0.11, ?2 = 0.09). However, redundancy analysis identified total phosphorus (TP), sodium (Na) and altitude (ALT) as significant variables in terms of their ability to describe the distribution of stomatocysts. Major ion and nutrient concentrations were also found to be strong predictors of diatom variation from the same lake set. In comparison to the diatom assemblages from the same lakes, the cysts were less abundant and showed a lower amount of species variation. Reasons for the lack of the variation may be due to the predominance of unornamented and collective category cysts (i.e. cysts which cannot be differentiated under the light microscope).

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Alaska.

UNIVERSITY OF SASKATCHEWAN

00-050 MCEWEN, D.J., GUO, W. and LLOYD, N. (2000). "Dynamics of the Polar F-Region." Advances in Space Research, July 1998.

ABSTRACT/DESCRIPTION:
F-region dynamics in the central polar cap region are being routinely monitored from an observatory at Eureka, Canada (89 CGL) using photometric and imaging devices and a Fabry-Perot Interferometer measuring neutral winds from 01 6300 A emissions. A case study is presented of a magnetic storm on December 30, 1997 during which winds increased to 500 m/s then rapidly decreased to 100 m/s when IMF Bz switched northward and a sustained polar aurora was triggered.

DISCIPLINE: Physics.

FIELDWORK LOCATION: Eureka, Canada.

00-051 MCEWEN, D.J., GUO, W. and LLOYD, N. (2000) . Challenges in investigating protostrongylids in northern hosts: *Parelaphostrongylus odocoilei* in Dall's sheep of North America. Oral Presentation with Abstract, International Workshop on Arctic Parasitology, October 3, 2000.

ABSTRACT/DESCRIPTION:
Recently, we recovered the muscle-dwelling nematode *Parelghostrongylus odocoilei* from Dall's sheep in the northern and southern Mackenzie Mountains, Northwest Territories, Canada. Our preliminary work highlights challenges in investigating host-parasite relationships in wild ruminants where little baseline data are available. Our approach involves fecal surveys to determine geographic and seasonal distribution of this parasite, including determination of the prevalence and intensity of parasitic infection. Each step is complicated by significant practical difficulties: (1) documenting and interpreting parasite and host genetic and phenotypic variation; (2) the possible presence of multiple species or cryptic species; and (3) complex evolutionary history and historical biogeography of a host-parasite relationship. We address the role that parasites play in the health status of hosts by monitoring experimentally infected animals and measuring key parameters. In the wild, the effects of a single parasite on host population health are difficult to separate from those of other parasites, pathogens, and other mortality factors. This synergy among host stressors is exemplified by the lungworm-pneumonia complex in bighorn sheep. Host-parasite assemblages are subject to a dynamic environment where the impacts of anthropogenic changes, including global warming and habitat loss, and new pathogen introduction, are increasingly recognized. Northern ecosystems may be particularly sensitive to such disruptions, or in the case of global climate change, at the epicenter of the phenomenon. The need to obtain baseline data on the distribution of parasites and pathogens in northern ecosystems is clear.

DISCIPLINE: Life Sciences.

FIELDWORK LOCATION: Fort Simpson, South Mackenzie Mountains, N.W.T.

00-052 **ROSEMOND, S.C., LIBER, K., WAITE, D. and HARBICHT, S. (2000).** The Toxicity of an Effluent Produced by a Diamond Mine in the Northwest Territories to Zooplankton. Platform Presentation, 27th Annual Aquatic Toxicology Workshop, St. John's, Newfoundland, September 30 to October 3, 2000.

ABSTRACT/DESCRIPTION:
The Ekati Diamond Mine, NWT, manually extracts diamonds from kimberlite using chemical free processes that reduces the ore to fines (---0.5 mm). An effluent consisting of the fines, coagulants, flocculents and the waste water employed during the extraction process is pumped to the Long Lake Containment Area. Examination of field data indicates that native zooplankton populations have been adversely impacted by the addition of the effluent to the Containment Area. In laboratory experiments, the effluent did not prove to be acutely toxic to *Ceriodaphnia dubia*, however, a series of chronic toxicity tests (7 d) revealed that the filtered effluent significantly affected survival at concentrations of approximately 50%, and reproduction at concentrations as low as 12.5% to 25%. Currently, a series of toxicity identification evaluations (TIE) are underway to investigate the toxic nature of the effluent to *C. dubia*. A TIE using EDTA as a chellator failed to reduce toxicity of 100% and 50% effluent to *C. dubia*, indicating toxicity may not be caused by certain cationic metals. The toxicity of 100% and 50% effluent was partially reduced by adjusting the pH to 6.5, which indicates that toxicity may be, at least partially, caused by pH-dependent toxicants such as ammonia. Additional Phase I TIE experiments are currently underway to identify components of the effluent that may be responsible for toxicity.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Ekati Diamond Mine, N.W.T.

00-053 **ROSEMOND, S.C., LIBER, K., WAITE, D. and HARBICHT, S. (2000).** Effects of Processed Kimberlite Effluent From the Ekati Diamond Mine, NWT, on Freshwater Zooplankton. Poster Presentation, Society of Environmental Toxicology and Chemistry 21st Annual Meeting, Nashville, Tennessee, November 12 - 16th, 2000.

ABSTRACT/DESCRIPTION:
In the fall of 1998, BHP's Ekati Diamond Mine began mining operations in Canada's Northwest Territories. Diamonds are found in or e (kimberlite) deposits and extracted manually using chemical-free processes, that reduces the ore to fine particles (--,0.5 mm). These fine particles, along with coagulants, flocculents and water used during the extraction process, are pumped to the designated containment area, Long Lake. In conjunction to field collected data from Long Lake, laboratory toxicity tests, using *Ceriodaphnia dubia* as the test organism, have been conducted to evaluate the magnitude of effects that the processed kimberlite effluent (PKE) has on zooplankton. A series of Phase I Toxicity Identification Evaluations (TIE) have been performed in order to classify the components of PKE that are toxic to zooplankton. Examination of field data indicate that zooplankton populations have been adversely impacted by the addition of PKE to the Containment Area. Neither the supernatant nor the filtrate of PKE proved to be acutely (48 h) toxic to *C. dubia*. Chronic toxicity tests (7 d) of undiluted supernatant and filtrate revealed that reproduction and survival were negatively affected. Chronic serial dilution toxicity tests with two different batches of effluent indicated that filtered PKE significantly affected survival at concentrations of approximately 50%, and reproduction at concentrations as low as 12.5% to 25%. A TIE using EDTA as a chellator failed to reduce toxicity of 100% and 50% PKE to *C dubia*, indicating toxicity may not be. caused

by certain cationic metals. The toxicity of 1001/6 and 50% PKE was not significantly reduced by the adjusting the pH to 6.5, which indicates that toxicity may not be caused by pH dependent toxicants such as ammonia. Future studies using C 18 resin column will be conducted to evaluate if the toxicity of PKE to zooplankton is caused by non-polar organics.

DISCIPLINE: Environmental Sciences/Ecology.

FIELDWORK LOCATION: Ekati Diamond Mine, N.W.T.

00-054 SQUIRES, M. and LESACK, L. (2000). Distribution and abundance of macro-autotrophs among lakes of the Mackenzie Delta. Paper, American Society of Limnology and Oceanography annual meeting, Copenhagen, June 5- 10, 2000.

ABSTRACT/DESCRIPTION:
The Mackenzie Delta (western Canadian Arctic) contains 25,000 lakes, and the frequency and duration of river flooding and proximity of lakes to river channels may strongly control distributions of aquatic organisms via effects of suspended sediments and DOC on water transparency. In a connected chain of 10 lakes, where flooding frequency was uniform, but where increasing distance from the river channel resulted in a strong transparency gradient, macro-autotroph biomass increased exponentially from 0 to 1000 g rm-2 with increasing transparency. In a sample of 27 lakes (non-connected) from t he greater population of the delta, where flooding frequencies were variable but the lakes were cross-classified with either short of long connection distances from river channels, the relation between changes in water transparency and macro-autotroph biomass, was roughly consistent with the lake-chain system. In contrast to the lake-chain, the effect of water depth (: one determinant of bottom illumination) on macro-autotroph biomass changed from negative to positive with increasing water transparency. We postulate the increased biomass with increasing water depth in the more transparent lakes may be result from attenuation of harmful UV-irradiances.

DISCIPLINE: Limnology.

FIELDWORK LOCATION: Mackenzie Delta, N.W.T.

00-055 SANDERCOCK, B.K., LANK, D.B., LANCTOT, R.B. et. al. (2000). "Ecological correlates of mate fidelity in two arctic-breeding sandpipers." Canadian Zoology, 78:1948-1958.

ABSTRACT/DESCRIPTION:
Monogamous birds exhibit considerable interspecific variation in rates of mate fidelity between years, but the reasons for this variation are still poorly understood. In a 4-year study carried out in western Alaska, mate-fidelity rates in Semipalmated Sandpipers were substantially higher than in Western Sandpipers, despite the similar breeding biology of these sibling species. Divorce was not a response to nesting failure in Western Sandpipers, and mate change had no effect on the reproductive performance of either species. Nor were mate-fidelity rates related to differential rates of breeding dispersal, because the species did not differ in site fidelity. Reunited pairs and males that changed mates showed strong site tenacity, while females that changed mates moved farther. Differences in local survival rates or habitat are also unlikely to explain mate fidelity, since the two species did not differ in local survival rates, and they bred in the same area, sometimes using the same nest cups. Although we were able to reject the above explanations, it was not possible to determine whether mate retention was lower in Western than in Semipalmated Sandpipers because of interspecific differences in mating tactics, time constraints imposed by migration distance, or a combination of these factors. Western Sandpipers exhibited greater sexual size dimorphism, but also migrated for shorter distances and tended to nest earlier and more asynchronously than Semipalmated Sandpipers. Finally, we show that conventional methods underestimate divorce rates, and interspecific comparisons may be biased if breedingdispersal and recapture rates are not considered.

DISCIPLINE: Ecology.

FIELDWORK LOCATION: Alaska.

00-056 **ANTONIADES, D. (2000).** Freshwater diatoms from Alert, Ellesmere Island, Canadian High Arctic. Conference Abstracts, Program and Abstracts, 6th National Students' Conference on Northern Studies, Quebec, Quebec, May 7, 2000.

ABSTRACT/DESCRIPTION:
The Alert military base is located at the northern tip of Ellesmere Island, close to the most northern point of land on this planet. As part of our overall efforts to document the limnology of arctic environments, we sampled a suite of ponds and lakes in close proximity to the base. Our main goal was to determine which diatom taxa survive in this extreme environment of prolonged cold temperatures, a short growing season, and high UV radiation. Diatoms from surface sediments were identified, and Canonical Correspondence Analysis (CCA) used to explore which environmental variables most influenced species assemblages. The Alert sites exhibited a narrow pH range (8.4 to 8.9), but a broad range in conductivity (60 to 890 uS). Over 150 diatom taxa were identified. Similar to our other high arctic sites, assemblages were composed almost exclusively of benthic taxa. However, the Alert flora was strikingly different from our other high arctic sites. CCA indicated that, similar to other high arctic calibration sets, gradients explaining diatom distribution were controlled by conductivity and nutrients. High arctic regions, such as Alert, are believed to be especially sensitive to climatic changes. Reconstruction of past environments will be performed using dated sediment cores.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Alert, Nunavut.

00-057 **ANTONIADES, D., DOUGLAS, D. and SMOL, J.P. (2000).** Diatom autecology and paleolimnology of Ellesmere, Ellef Ringnes, and Prince Patrick Islands, Canadian High Arctic. Conference Abstracts, Abstracts, 8th International Paleolimnology Symposium, August 20, 2000.

ABSTRACT/DESCRIPTION:
In assessing the significance of modern environmental change, knowledge of baseline conditions is necessary to understand whether current changes fall within normal ranges for the High Arctic. Paleolimnological models using diatom-based transfer functions are being developed from three high arctic sites in an attempt to provide these missing High Arctic data sets. Samples have been collected from Alert, northern Ellesmere Island, Isachsen, Ellef Ringnes Island and Mould Bay, Prince Patrick Island. All sites were oligotrophic. Trace metal and ion values were typical of those from other high arctic studies. Nutrients were lower at Alert than at other arctic sites, including DOC, nitrogen, and phosphorus. Higher DOC and nutrient levels were observed at Mould Bay. A benthic diatom assemblage comprising over 400 taxa has been identified across all three sites. *Achnanthes minutissirna*, *Nitzschia perminuta*, and *Navicula cryptotenella* were the most common diatoms in the Alert area. Isachsen and Mould Bay have varied diatom assemblages each comprising over 200 species, but have no clearly dominant taxa. Multivariate ordination of Alert data shows that diatom communities are most closely related to conductivity. This autecological information will be used to interpret paleolimnological changes in sediment cores from these sites.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Alert, Nunavut, Mould Bay, N.W.T.

00-058 **ANTONIADES, D., DOUGLAS, M., SMOL, J., LIM, D. and MICHELUTTI, N. (2000).** Applications of Diatoms to Assessing Paleoenvironmental Change in the Canadian High Arctic. Conference Abstracts, GeoCanada 2000, June 6, 2001.

ABSTRACT/DESCRIPTION:
The High Arctic is recognized as an important reference area for global environmental change, as it has been shown to be highly sensitive to changing environmental conditions. However, detection of environmental change can be difficult, as no direct long-term records exist. Proxy methods using paleolimnological approaches are thus invaluable due to their ability to reliably infer past conditions. Diatoms are sensitive recorders of environmental change in aquatic systems, and have been used in many paleoenvironmental reconstructions. Diatoms track changes in salinity, nutrients, acidity, presence of aquatic vegetation, and other physical and chemical variables. Many high arctic lakes retain perennial ice cover, thawing only at the fringes for short periods during summer. Due to the control of snow and ice cover on light transmission and habitat availability, changes in the degree of ice cover will be recorded by diatom assemblages. Trends in diatom communities can be used to reconstruct changes in past ice cover. Certain taxa are characteristic of High Arctic stream environments. These taxa increase in concentration in lake sediments during periods of higher sedimentation, which are inferred to be years of greater stream runoff. As such, diatoms have the potential to reconstruct past precipitation levels in High Arctic catchments.

DISCIPLINE: Geology.

FIELDWORK LOCATION: Alert, Ellesmere Island, Lake Sophia, Cornwallis Island, N.W.T.

00-059 **FARAHANI, E., BASSFORD, M.R. and STRONG, K. (2000).** Ground-Based Measurements of the Arctic Stratosphere from Eureka. Conference Poster, 6TH National Student Conference on Northern Studies. Universite Laval, Quebec, Quebec, May 2000.

ABSTRACT/DESCRIPTION:
Stratospheric ozone depletion leads to increases in solar ultraviolet radiation at the Earth's surface which can damage natural ecosystems. The discovery of the Antarctic "'ozone hole" and later observations of mid-latitude ozone loss prompted a reassessment of our understanding of ozone chemistry. In the Arctic, the springtime ozone column has suffered unusually high rates of depletion during the 1990s. There is significant interest in the magnitude of and mechanisms for Arctic ozone destruction, particularly as models predict that it could be further enhanced over the next few decades by increasing accumulations of greenhouse gases such as C02 which act to cool the stratosphere. In order to assess the accuracy of such model predictions and to elucidate the destruction pathways, we are using a ground-based spectrometer deployed at Environment Canada's Arctic Stratospheric Observatory (ASTRO), located at Eureka, NT. The main component of our instrument is a UV-visible grating spectrometer fitted with a charge-coupled device detector, housed in a weatherproof aluminum trunk. This is used to record absorption spectra from which vertical column amounts of ozone, N02, BrO, OCIO, and N03 can be retrieved. This instrument was successfully deployed in two field campaigns: at Vanscoy, SK in August 1998 and at Eureka, NT from March to May 1999. During both of these campaigns, the instrument was operated in zenith-sky mode, recording spectra of scattered sunlight, which were analyzed using differential optical absorption spectroscopy. The instrument will again be deployed at Eureka from February through May 2000, and will include a new feature, a star-tracking telescope, optically coupled to the spectrometer in order to allow measurements of the target gases during polar night. With the combination of stellar and solar observations, we will be able to monitor stratospheric composition during the crucial winterspring period when the conditions leading to ozone loss develop. These

measurements will expand the range of stratospheric gases monitored at Eureka and furnish new information on polar ozone destruction. This presentation will describe the instrumentation and the analysis technique, and will discuss results from the Eureka campaigns.

DISCIPLINE: Physics.

FIELDWORK LOCATION: Eureka, Nunavut.

00-060 **JOOS, R. and HANSELL, R.I.C. (2000).** Vegetative Structure, avian foraging behaviour, and predator avoidance. Conference proceedings, Goose Conference; AOU Conference; Botany Seminar, University of Toronto, December 1, 2000.

ABSTRACT/DESCRIPTION:
Vegetative structure has a significant effect on bird species through predator avoidance syndromes and foraging/strategies. Transects in the Churchill River tundra biome document significant negative impacts of seasonal foraging of *Branta canadensis* on emergent as opposed to woody vegetation. Parallel transects in more southerly, Toronto, ecotones note very different foraging/foraging avoidance behaviour and similar, but not identical, use of vegetative/spatial structures in predator avoidance. Landscape scale experimental manipulation show that presence/absence of Canada geese may be ecologically manageable by a combination of modified exclosures and vegetative structure reconfigurations in appropriate habitats.

DISCIPLINE: Ornithology/Botany.

FIELDWORK LOCATION: Churchill, Northern Manitoba.

00-061 **LIM, D.S.S. (2000).** Diatoms in the Canadian High Arctic - An examination of community relationships and microhabitat preferences as a key to tracking climate change. Poster Presentation, 6TH National Student Conference on Northern Studies, Universite de Laval, Quebec, Canada, May 2000.

ABSTRACT/DESCRIPTION:
The lakes and ponds that dot the high arctic landscape are extremely sensitive to environmental changes, both natural and introduced by human activity. In order to effectively monitor change in these aquatic systems, we need to: (a) understand the natural viability of past environments; (b) determine the environmental conditions prior to anthropogenic influences; and (c) be able to make predictions about future climate change. For these reasons, historical limnic data are needed to reconstruct past aquatic environmental conditions, however relatively little of this data exists for this remote region. In the High Arctic, the use of periphytic diatoms (class Bacillariophyceae) in biomonitoring and paleoecological assessments is of particular u tility to acquire both baseline and historical linmic and environmental data, which would otherwise be impossible to procure. More specifically, by determining the microhabitat and substrate preferences of diatom taxa, the potential exists to infer past changes in available habitats from fossil diatom assemblages collected from sediment cores, and ultimately to reconstruct past environmental and climatic shifts.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Bathurst Island, Nunavut.

00-062 LIM, D.S.S., DOUGLAS, M.S.V. and SMOL, J.P. (2000). Diatoms and their relationship to environmental variables from lakes and ponds on Bathurst Island, Nunavut, Canadian High Arctic. Presentation, Hydrobiologia, November 14, 2000.

ABSTRACT/DESCRIPTION:
Diatom taxa are preserved in the surficial sediment of lakes and ponds on Bathurst Island, Nunavut, Canadian High Arctic, and their relationship to 33 environmental variables were examined using multivariate statistics. Baseline and historical environmental data are sparse in the High Arctic, however diatom assemblages preserved in high arctic lakes and ponds can provide proxy data of past environmental changes. Environmental variables Fe3+, Total Phosphorus (Unfiltered) (TPU), Total Nitrogen (TN), Temperature (TEMP), and pH significantly ($P<0.05$) accounted for variation in the diatom assemblages. TN was also significantly correlated to other nutrient constituents (e.g. TPF, DOC, POC), and most likely represented the collective effects of these other variables in affecting species distributions. A weighted-averaging (WA) model was developed in order to infer nutrient levels from the relative abundances of the 59 most dominant taxa. This model may be used to quantitatively estimate past TN levels from diatom assemblages preserved in sediment cores from Bathurst Island, and may provide a means to track trophic change as a result of climate change in the High Arctic.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Bathurst Island, Nunavut.

00-063 LIM, D.S.S., DOUGLAS, M.S.V. and SMOL, J.P. (2000). "Periphytic Diatom Assemblages from Bathurst Island, Nunavut, Canadian High Arctic - An Examination of Community Relationships and Habitat Preferences." Journal of Phycology, April 3, 2000.

ABSTRACT/DESCRIPTION:
In order to refine our understanding of diatom habitat preference, the dominant diatom taxa found on submerged moss (bryophyte), sediment, and rock substrates from lakes and ponds on Bathurst Island, Nunavut, Canadian High Arctic are examined using multivariate statistical methods. Furthermore, the relationship between key limnological variables and the dominant taxa from each habitat is discussed. The following linmological variables significantly (P:0.05) explain the species variance for each of the three substrates: Na+ and Total Nitrogen (TN) for moss; Total Phosphorus (Filtered) (TPF) and pH for rock; and Fe3+, Total Phosphorus (Unfiltered) (TPU), TN, Temperature (TEMP) and pH for sediment. This paper extends the current ecological database for high arctic diatoms, and will play a key role in both understanding biodiversity levels in the High Arctic as well as provide baseline data for future paleoreconstructions of aquatic habitat structure.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Bathurst Island, Nunavut.

00-064 LIM, D.S.S., DOUGLAS, M.S.V. and SMOL, J.P. (2000). Diatom-based models to infer past limnological and habitat characteristics of lakes and ponds on Bathurst, Devon and Banks Island, Canadian High Arctic. Poster Presentation, 8TH International Paleolimnology Symposium, Queen's University, Kingston, Ontario, Canada, August 2000.

ABSTRACT/DESCRIPTION:

As a first step in using diatom assemblage remains in paleoenvironmental projects, we need to define the ecological optima and tolerances (autecology) of the common species. Typically defining diatom autecology for bionionitoring and reconstruction purposes is conducted by relating surface sediment assemblages to measured limnological variables in the construction of a calibration set. However, these surface sediment remains represent a collection of diatom assemblages from various periphytic sources, such as those diatoms associated with moss and rock substrates as well. In an effort to refine the paleoenvironmental reconstruction capabilities of the surface sediment assemblages, as well as account for a significant portion of species variance, diatom microhabitat preference should also be considered. Lake and pond diatom surface sediment collections, in addition to diatom samples from moss and rock substrates from Banks Island, NWT and Devon Island, Nunavut will be analyzed and calibration sets constructed. The calibration sets will be applied to cores taken from present day lakes on both Banks and Devon Islands as part of the first author's doctoral studies. This work will contribute to the on-going goal of PAL and PEARL to create both a spatial and temporal map of environmental data from the High Arctic.

DISCIPLINE: Paleolimnology.

FIELDWORK LOCATION: Bathurst, Devon and Banks Island, Nunavut.

00-065 **LIM, D.S.S., DOUGLAS, M.S.V., SMOL, J.P. and LEAN, D. (2000).** Physical and Chemical Limnological Characteristics of 38 Lakes and Ponds on Bathurst Island. Nunavut. Canadian High Arctic. Presentation, International Review, Hydrobiology, January 1, 2000.

ABSTRACT/DESCRIPTION:
The limnological features that characterize the shallow ponds (<2 m deep) and lakes (>2 m deep) on Bathurst Island, Nunavut, Canada were examined through chemical analyses and multivariate statistical methods as part of a larger on-going survey to document and monitor environmental changes in these remote and sensitive areas. All sites were relatively oligotrophic and alkaline. Nutrient ratios indicated that nitrogen could be limiting algal growth to a greater degree than phosphorus in over 63% of the sites. Principal components analysis (PCA) was used to explore the patterns of variation in the limnological dataset. The three dominant linmological gradients were: major ion content, and dissolved organic carbon (DOC) levels along Axis 1; and pH along Axis 2.

DISCIPLINE: Limnology

FIELDWORK LOCATION: Bathurst Island, Nunavut

00-066 **SMITH, L. and HOLMES, C. (2000).** Old Microblades, New Story: A return to the Swan Point site (XBD-156), interior Alaska. Contributed Paper, Society for American Archaeology Annual Conference, April 4th, 2000.

ABSTRACT/DESCRIPTION:
In 1994 the recovery of microblades from the lowest component of the Swan Point site (XBD - 156) in the middle Tanana Valley of interior Alaska caused much consternation amongst archaeologists. The evidence unequivocably demonstrated the presence of a microblade technology in Alaska pirior to 11,500 years BP, requiring the existing paradigm of a non-microblade to microblade transition to be revisted. Subsequent research at Swan Point provides new data for old microblades and hunter-gatherer mobility and settlement strategies in Alaska.

DISCIPLINE: Archaeology.

FIELDWORK LOCATION: Swan Point, Alaska.

00-067 **BURKHARDT, K.J. (2000).** Crime, Identity, and Cultural Alienation, Narratives of Inuit Inmates. Conference Proceedings, Narratives of Inuit Inmates, 6th National Student Conference on Northern Studies, Quebec, Quebec, May, 6th 2000.

ABSTRACT/DESCRIPTION:
The rates and nature of Inuit criminal activity are of great con cern in the Nunavut Territory. Substance abuse and the victimization of women are particularly salient issues in Northern communities. Such problems arc suggested to be a result of colonization processes, which have alienated Inuit individuals from their traditional knowledge and imposed upon them an unfamiliar system of justice. Presently, self-government strategies have been created to empower the Inuit's control of their own social structures. This is integral within the realm of criminal justice, as in the development of efficacious corrections it is imperative to understand the lived experiences of the Inuit. The present study has utilized grounded methodology to formulate theory derived from the Inuit inmates' perspectives of the justice system and treatment objectives. Participants from the all-male inmate population at the Baffin Correctional Centre were interviewed to determine their beliefs regarding identity, crime, rehabilitation. the roles of women, and their future. Recommendations for prevention and rehabilitation programming are provided toward an understanding of how to best facilitate the unique needs of the Inuit culture.

DISCIPLINE: Psychology.

FIELDWORK LOCATION: Iqaluit, Nunavut.

00-068 BROWN, L. and DR. YOUNG, K. (2000). Thermo climatological interactions of vegetation zones associated with a late-lying snowbed in the post snowmelt period. Oral and Poster Presentation, University of Toronto, November 4, 2000.

ABSTRACT/DESCRIPTION:
The aim of this study was to examine the linkages between ground thaw, warming and the response of vegetation in modifying the near-surface climatological conditions. The study took place in Resolute, Nunuvut. The area examined is associated with a late lying snow bed that provides moisture to the associated vegetation patches, which are adjacent to it. Several factors were examined for this study - with respect to the subsurface, the frost table and the water table were monitored, as well as soil moisture and hydraulic conductivity. For the vegetation covers, plant type, and rooting extent were determined. For the near surface climate conditions various meteorological parameters were measured and subsequently used to determine evapotranspiration. The amounts of precipitation and changes in the snow cover of the snow bank were also monitored. Linking all the effecting factors will provide a clearer explanation of the processes that occur involving the climate and surface interactions of a series of vegetation bands considered to be representative of the regional vegetation patterns. This information will allow surface characteristics (i.e. albedo, soil moisture) to be attached to various vegetation zones which can then be incorporated into climate change models to improve estimates of snowmelt, evaporation and ground thaw for high arctic environments.

DISCIPLINE: Physical Geography.

FIELDWORK LOCATION: Resolute, Cornwallis Island, Nunavut.

00-069 LOSETO, L. and YOUNG, K.L. (2000). Nutrient dynamics associated with a late-lying snowbank. University of Toronto, Oral and Poster Presentation, November 4, 2000.

ABSTRACT/DESCRIPTION:
The High Arctic pushes the limits of plant survival, research in this stressed environment is important in understanding relationships between plants and their physical environment. Vegetation zones exist downslope from late-lying snowbanks, due to constant supply of melt water. Water and nutrient availability are controlled by physical, biological and hydrological factors, which interact together to form unique microenvironments. This study seeks to understand interactions between physical gradients and nutrient dynamics within and between vegetation zones adjacent to a late-lying snowbank. The study took place in Resolute Bay on Cornwallis Island, Nunavut. Water chemistry was examined spatially, temporally and with depth into the ground at 0-15cm, 15-30cm, and 30-45cm, as well physical parameters such as active layer development, snow melt and hydraulic conductivity were examined. Maximum active layer development was around 50cm, and was saturated most of the growing season. Results revealed no temporal changes in water chemistry throughout the season. Ammonium concentrations (0.01 mg/L to 0.03mg/L) were much lower than nitrate concentrations (0. 1 mg/L to 0.3 mg/L). Nitrate concentrations increased with depth into the ground, whereas ammonium concentrations did not. Results suggest that small scale differences in vegetation zonation are not due to nutrient supply, rather may be controlled by physical factors.

DISCIPLINE: Hydrology.

FIELDWORK LOCATION: Cornwallis Island, Nunavut.

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